

# AMERICAN FORESTRY

THE MAGAZINE OF THE AMERICAN FORESTRY ASSOCIATION

PERCIVAL SHELDON RIDSDALE, Editor

DECEMBER 1917 VOL. 23

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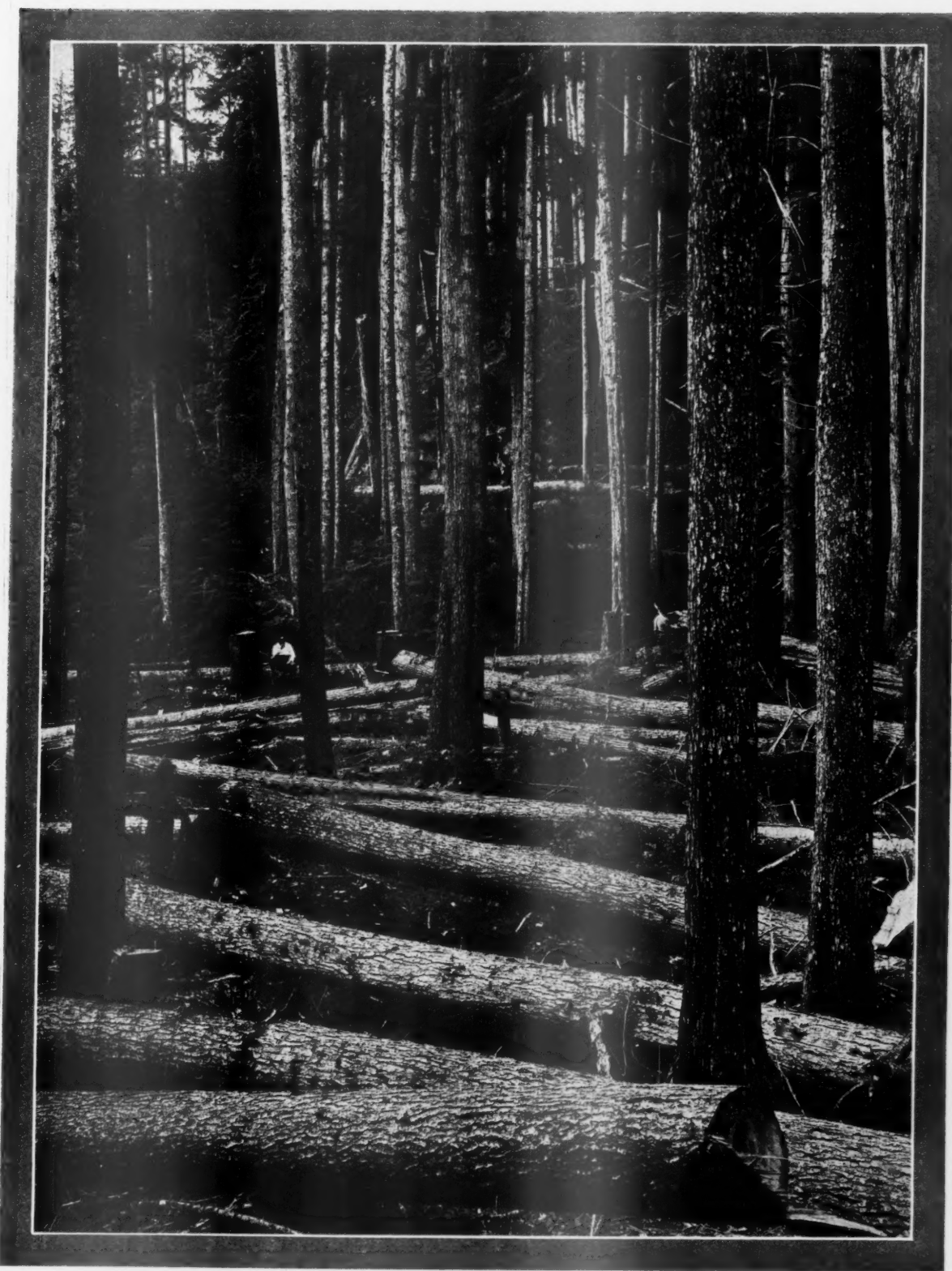
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#### HEMLOCK AND BALSAM FOREST IN BRITISH COLUMBIA.

This is a scene behind the felling crews. It is an unusual picture because of its clearness and the perspective. Red cedar is usually associated with the other timber in these forests, and the stand on the best types often cuts 75,000 to 100,000 feet per acre. Western hemlock is now being used extensively for pulpwood. It also makes excellent lumber, being much superior to eastern hemlock. The next step in the logging scene above is to skid the logs by cable to the head of the log road. The portable donkey engines in the woods are known as "skidders," the one at the foot of the log road is the "roader" or "bull donkey."

# DONATIONS FOR THE RELIEF AND COMFORT OF THE FOREST REGIMENTS

## COMMITTEE

CHARLES LATHROP PACK  
PERCIVAL SHELDON RIDSDALE  
ROBERT H. DOWNMAN

W. R. BROWN  
ALBERT F. POTTER  
WILLIAM L. HALL

Members of the American Forestry Association and others interested in forestry are asked to contribute to the fund now being raised to provide comforts and any necessary relief to the members of the Forest Regiments called for service in France.

These men, there are some 10,000 of them, have the task of supplying for the army of the Allies such absolute necessities as cordwood for cooking and heating, posts for trenches and mines, planks to haul heavy ordnance over, boards for hospitals and billets; ties for railroads, timber for temporary bridges and many other emergency uses. At least 25,000,000 board feet will be needed monthly. This will be obtained from the French forests, the only source available at present, due to lack of water transportation. These forests the French have generously agreed to sacrifice, but desire them cut, as far as it is possible, along forestry lines.

A joint committee has been formed of the lumbermen and forestry organizations of all kinds throughout the country, which will solicit funds and take charge of all sums raised for the comfort and relief of the men in these regiments. All such funds are to be expended to meet the special needs of the men in this special industry. Immediate needs are along the lines of comfort and recreation essential to physical and moral welfare, and later serious relief for soldiers and dependents will be pressing. To meet this larger and more vital demand members of the American Forestry Association are asked to contribute generously. Reports of the use made of contributions will be published from time to time in all of the lumber and forestry journals.

We confidently ask you to stand behind the men of the Forest Regiments who furnish the lumber which, next to ammunition and food, is the greatest need of the Allied army. The personnel of the committee will assure that every cent subscribed will be utilized to the full in assistance and relief. All funds are to be sent to Mr. P. S. Ridsdale, secretary of the American Forestry Association at 1410 H Street, N. W., Washington, D. C., which Association has offered to give its office accommodations and the time of its secretary, free, to the administration of the relief work.

FILL OUT AND SEND THIS FORM WITH YOUR CONTRIBUTION

## DONATION TO THE LUMBER AND FOREST RELIEF COMMITTEE

I enclose check for \$\_\_\_\_\_ a donation to be used for the comfort and relief of the men of the Tenth and Twentieth Engineers (Forest) Regiments.

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*A list of the donors will be acknowledged in the AMERICAN FORESTRY magazine each month.*



# AMERICAN FORESTRY

VOL. XXIII

DECEMBER 1917

NO. 288

## YE HOLLYE GREENE

DONALD A. FRASER

Ye hollye greene is Christis tree,  
Yt groweth cleane and springeth free,  
And all yts beauties reach their prime  
To grace His blest Nativitie.

Yts stately stem stands straight and still,  
As stood His roode on Calvary's hill,  
And, Lo! how slow yts growth, and sure,  
Just like His Kingdome 'gainst ye ill.

Ye thornes that pierced His brow in griefe  
Are set around each gleaming leafe,  
And chalices of precious bloode  
Are glowing in each berrye sheafe.

When nature's moping cheerlessly,  
Ye hollye shineth faire to see;  
Remember, Christians, be not sad,  
Ye hollye greene is Christis tree.

# A FORESTER AT THE FIGHTING FRONT

BY P. L. BUTTRICK

**Y**OU have seen in winter bare New England or western hillsides from which all the timber has been cut, except a few struggling, undersized trees and

a few old snags and over which a fire has swept, burning up the slash and blackening the snags and remaining trees. Over this a light snow has fallen, not heavy enough to form a complete mantle, but sufficient to cover most of the surface. Roughly following the contour of the hill and here and there running up and down across them are little ribbons, which stand out somewhat; skid roads, roughly hollowed trails made in getting the timber down the slope.

Such too familiar scene of desolation greeted my eyes when I first came out in the open from a young pine forest and looked out across a valley into a section of reclaimed but devastated France. The resemblance of the desolated country about

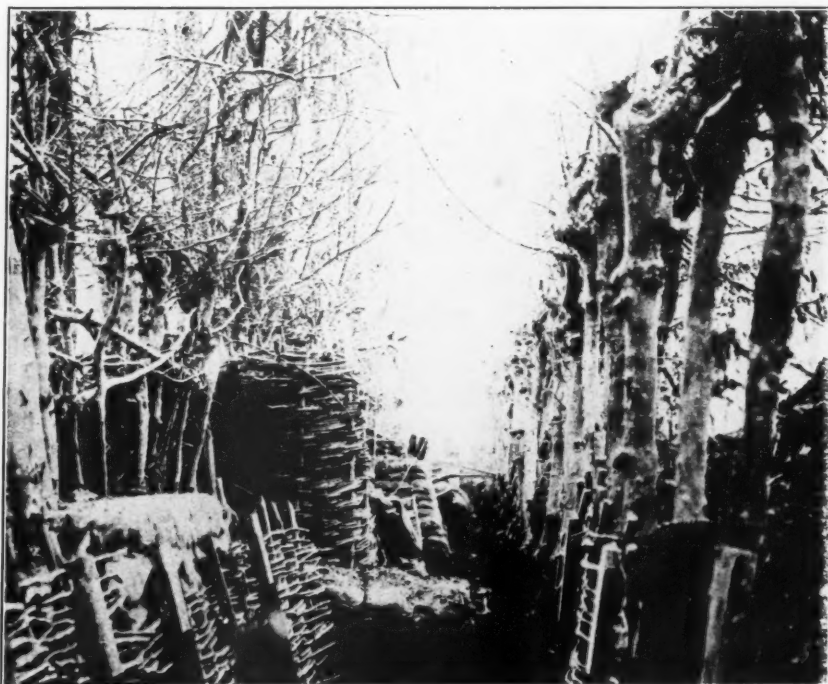
French and German trenches and in "No Man's Land" between was so striking that when a French "75" "went off" concealed nearby, the report subconsciously interpreted it-

self to my mind as a dynamite charge set off by the stump-blasting crew working on a new cutting.

The boom of the exploding shell and the column of dust spurting into the air in Boche land across the forbidden zone even more easily became in imagination a fallen pine raising a snow cloud as its spreading branches hit the ground.

After the Battle of the Marne the German retreat between Rheims and Verdun stopped at one place just outside a little village called Prones. This village is about half way up the western slope of a small valley.

The French first line of trenches were just below the village and the German's a little lower down in the valley. The valley on both sides was covered with a



Photograph Underwood & Underwood, New York.

## WELL HIDDEN TRENCH IN THE BRITISH LINES

It is safe to assume that the German forces would have difficulty in locating a trench as well concealed as the one here pictured. The timbers still carry spreading boughs and these give an effect that would make the real purpose of the trench hard to detect at a distance, whether viewed from an airplane or from the ground. The picture was taken as an official war photograph.



Photograph by P. L. Buttrick.

## WOOD IS USED EVERYWHERE

It is not merely in regular trench work that the product of the forest is utilized in building trench defenses. This picture shows reserve trench built up with baskets of pine boughs filled with sod. Such defenses are frequent.



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WHERE FORESTERS AND WOODSMEN ARE IMPORTANT IN MODERN WARFARE

This scene near Zillebeke is taken from an official British photograph. It shows British soldiers at work cutting down trees for the purpose of procuring timbers to be used in road-making and in strengthening dug-outs. The picture was taken during the Flanders drive and shows a type of activity that is carried on all over the war zone.

thick growth of sapling pine, some planted, some natural growth. For over two years little change took place and the trees continued to grow unmolested. In the spring of

1917, however, the French determined to advance their lines. Accordingly, artillery was massed in the woods back of the village. At a given time the French opened



Copyright by Underwood & Underwood, New York.

A FRENCH BATTERY RETURNING FROM THE FIRING LINE

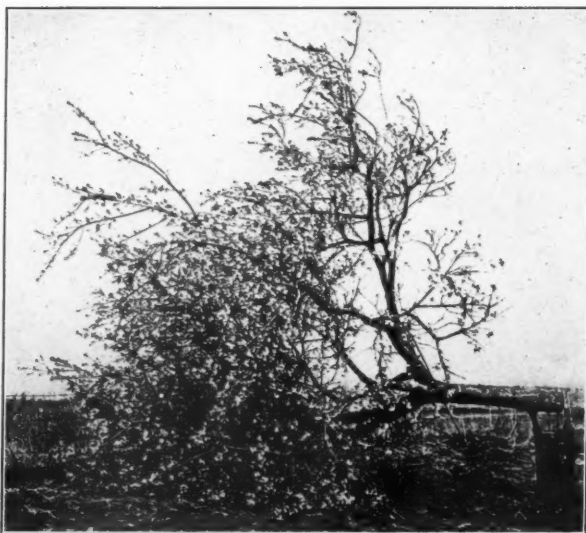
In this peaceful forest scene the only suggestion of war is afforded by the long line of soldiers. These men are returning through the woods, on their way to the rear, after a long siege of shelling the lines of the enemy. The pictorial effect is that of a woodland spot in the vicinity of any American city—but the thrill of war is there, none the less.



a barrage fire which practically leveled the German trenches and obliterated the woods on the hillside. The very earth was turned upside down on parts of the terrain. Over this man-made desert the French infantry advanced and occupied the German trenches way to the top of the opposite hill.

The white appearance of the hillside, so much resembling light snow, is due to the chalky, limestone character of the rock and soil. The lines so closely resembling skid roads were of course the trench lines.

The writer would have liked the opportunity of studying more closely the



*Photograph Underwood & Underwood, New York.*

#### HOW THE INVADERS TREAT FRUIT TREES

In their retreat along the Aisne the Germans left the mark of their ruthlessness on the entire countryside. The fruit tree here shown is typical of the destruction wrought. The picture is from a French official photograph.

effect of modern, intense, artillery fire on soil and tree growth. While he might have done so for a short time no censor would have had to trouble himself to read any manuscript of the investigation.

From what could be seen, however, modern artillery fire can produce a degree of destructiveness to soil and forests far in excess of that ever done in the most destructive lumber operations, even when followed by forest fire. It is said that the devastation in this section is as nothing to that in some places in Flanders. One can conceive, of course, of more complete destruction than



*Photograph Underwood & Underwood, New York.*

#### THE HAVOC OF WAR AS TOLD IN DESTRUCTION OF FORESTS

Determined to harass the enemy in every possible way, the German forces destroy forests as well as cities and farm crops. Manifestations of this spirit of ruthlessness, such as pictured above, mark the entire line of retreat of the Teutons. This picture shows the growth of years destroyed with a few strokes of the ax.



that which I saw, but even here the productive capacity of the soil for forest growth, to say nothing of agriculture, has been almost irreparably impaired.

While the trenches may be filled up in the valley and the fields restored, their immediate value will be slight. Sub-soil ploughing has its advantages, but no one would consider land over which a gold dredge had operated to be desirable farm property, and much of the valley land resembles western land so treated.

It will take careful study and experimentations to discover the tree-growing capacity of the hillsides—studies not easily made under shell fire.

shells into these woods from time to time, "fishing" for these concealed batteries. The effect is that of a heavy ice storm combined with a moderately high wind—broken branches, shattered tops, occasional trees uprooted or broken down.

A more complete study of this light shelling would have been interesting, particularly if an opportunity could have been afforded to compare the effect of shrapnel and high explosive shells, but wars are not conducted for the benefit of foresters, of foresters with an investigating turn of mind.

A visit to the trenches themselves showed some inter-



*Photograph by International Film Service.*

#### PHOTOGRAPH TAKEN DURING AN AVIATOR'S DEATH FALL

This remarkable photograph was found in a camera picked up near the wreck of a flying machine in which an aviator had just fallen to his death, after a shot from a German air raider. It is assumed that the camera had been fixed for exposure and that when the stricken machine dropped the picture was taken automatically. It is believed that the scene pictured is that of an exploding shell, as no other theory explains the cloud of smoke and dust at the left. This mute evidence of the camera bestirs a picture of the thrill of war as experienced by the man who braves the perils of the air in a winged ship. When an airplane is successfully attacked by an enemy plane the aviator knows no escape. With his machine wrecked his plunge to death is inevitable. In this forest scene is given a suggestion of the type of woodland in which American Forest Regiments are at work. The bleakness of the landscape is in keeping with the general appearance of the forests in the war zone, but there is good timber available in the standing trunks.

The German fire was either directed largely against the French infantry advance or was not especially heavy, judged by barrage standards.

The writer had the opportunity of visiting some of the French batteries concealed in the woods back of the lines. The timber was a rather dense stand, some thirty years old, I should suppose. The Germans had dropped

esting uses of wood products. Most of the dugouts resemble in their construction vegetable cellars and powder magazines of our northern lumber camps, being built of small logs and poles banked with earth. The stiff soil of the region holds up well and the trenches require little shoring up.

When it is required the French use large numbers of

gabions or rough baskets of woven pine branches and filled with earth, this being one of the first uses the writer has ever seen for pine twigs.

A walk through some of the captured German trenches seemed to show that they preferred concrete for the purpose of shoring up, as it is hard to believe that they expected the rather thin layer of concrete and a lean mixture at that to withstand artillery fire.

If they did ~~t h e~~ Kaiser must have profusely "strafed" the engineer who planned the work, for the French fire knocked it into fragments or overthrew considerable sections in good sized sheets. One might hazard the guess that ~~t h e~~ French basket work would be a safer bulwark and more enduring than the German concrete.

Behind the trenches much use is, of course, found for wood of all sorts and sizes, some novel uses as well as many old standbys. The corduroy road of Civil War times and logging camp stories is in evidence, as A. R. C. ambulance drivers are prepared to testify.

Rough log and board shacks have sprung up all over the war zone for use as store houses, barracks, hospitals and the like. Many of the board shacks are made of poplar boards sawed from Lombardy Poplars which lined so many of the French highways.

Another interesting but dissimilar use of wood products is the making of fake plantations along

roadsides to screen troop and supply movements from the enemy. At first, apparently, large numbers of young pines were cut down and set up alongside the roads. Later this gave place to the hanging of pine branches on wire and frames supported by poles. Straw, grass and burlap are used in the same fashion. How successful this form of camouflage is can be realized only when

one sees a road from a high observation tower through a telescope or from an airplane.

From very ancient times the military man has recognized the value of forests for concealment from and deception of the enemy. The American Indian understood this perfectly and used it most successfully, but his descendants serving

with the American Expeditionary Forces may learn much from the French.

Not the least interesting feature of my first day at the front was the discovery of the many and varied activities of a modern army and the actual army itself. hidden away in a dense young pine forest. Naturally, little or nothing can be told about this, but much was strangely reminiscent of logging camps "back home"—log huts, blacksmith shops, stables, teams, narrow gauge railroads, even felling operations, for military purposes, of course. An occasional Soixante Quinze, not to mention guns of larger calibre, might seem to supply a somewhat discordant note to any logging camp, but when a gun appears to be merely a pair of wheels



Photograph by P. L. Buttrick.

#### ONE OF FRANCE'S RUINED VILLAGES

This was one of the stopping places in the German retreat after the battle of the Marne. The enemy occupied a position near the village until the spring of 1917, when driven out by French barrage fire. The destruction is complete.



Photograph Underwood & Underwood, New York.

#### SOLE SURVIVOR OF AN ITALIAN BOMBARDMENT

Giving an effect much like an eagle with spreading wings, this remnant of a tree is the only thing left even partially intact on the entire mountain-side of Mount Santo, which was taken by the Italians. The picture was taken by the Italian government.



Photograph by P. L. Buttrick.

#### HOW WOOD HELPS TO WIN

In trench building timbers are indispensable. This shows the use of wood in throwing up trenches in the French war zone. The Engineer regiments of American foresters and woodsmen will supply materials for this purpose, among others.

from a logging wagon upon which has fallen a small log, one takes it quite for granted.

Lumber jacks dressed uniformly in horizon blue and wearing fatigue caps or steel helmets, might look like a



Photograph by P. L. Buttrick.

#### ROAD CAMOUFLAGE IN FRANCE

Suggesting some of the methods applied for the purpose of misleading the enemy and preventing him from knowing too much of what is being done. This shows a screen covered with pine boughs in the Champagne region.

strange setting in front of a bunk house, but after a few weeks of familiarity with men in such garb, which in active use soon takes on a work-a-day appearance, one takes them as quite a part of the scheme of things. In



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#### HOW WOOD AND WIRE HAMPER THE FIGHTERS.

This mass of entanglements is directly in front of that line of trenches known as the Hindenburg line. This line was supposed to be impregnable and the Germans had built trenches there, as showing that they intended to stay at the place for a long time. The British soldiers of the western front cut through the entanglements and drove the enemy from his position. The picture shows the results of the cutting through.



fact, the whole thing seems very work-a-day and non-military, but then the present business of mankind is war, and this is a very work-a-day war.

Regarding Belgium a dispatch from Paris says: "It will be a treeless Belgium to which the people of that unfortunate country will return, if its invaders are not driven out before they have completed their work of devastation. Factories have been despoiled of their machinery, every form of property has been requisitioned, and now woods, forests and even individual trees are being cut down wholesale. The wooded heights of the Belgian Ardennes, which used to protect the center of the country from east winds, are rapidly being denuded, the tall elms that lined the high roads and canals have been felled, and walnut trees that adorned the gardens of the well-to-do in Brussels have not been spared.

"In the early days of the occupation, the Belgian State Forest Department was allowed to supervise the work of

falling and see that it was scientifically conducted, but after a few months, the Germans took over the direction of the department and observed only one rule—to obtain the greatest amount of wood for military purposes in the shortest possible time.

"The Belgian government has been able to learn details of the work done, such as that 1,000 acres have been cleared in the Hertogenwald (Liege) and felling continues there, the fir plantation, 'Fays de Lucy,' the finest in the country, has been completely razed, and the magnificent forest of Soignes, south of Brussels, is rapidly disappearing. These are only examples of dozens of similar cases which are known, and to this devastation must be added the consumption of wood by the native population which for three years has been unable to import any and has had to use quantities instead of coal.

"Serious consequences from every point of view, health, climate and hydrographic, are expected from this widespread destruction of woods and forests, if it continues another year or two."

## HOW WARFARE TAXES THE FORESTS

ONE of the big developments of the war is the extent to which it has educated American lumbermen to think in mighty figures without visible signs of excitement. Two or three years ago a buyer for a hundred million feet of lumber would have thrown the industry into a fever and delivery would have been a matter of long negotiation and discussion. Today the lumber trade deals in billions of feet and orders are filled overnight.

Forest products enter into modern warfare on a tremendous scale. Practically everything an army does calls for wood in one form or another. From encampment construction to trench building and from munitions to flying machines the forest is an indispensable source of supply and the woodsman an essential ally. Wooden ships and wood alcohol, paper shirts and cellulose, chloroform and surgical dressings; all these and countless other articles necessary to successful warfare depend on the forest for their origin.

Of the hundreds of millions of feet of lumber required for the building of the encampments for national army and national guard the story has already been told. To this must be added in a vast aggregate the materials used in aviation camps, supply depots and the other forms of construction required in preparing the United States armed forces for their battle to make the world safe, and the other hundreds of millions of feet used in the building of ships for the emergency fleet. All this material has been produced and delivered in a space of time amazingly short and the current demands are steadily receiving the same priority of attention at the hands of lumber manufacturers and transportation companies.

With a lumber industry already keyed up to high pitch of efficient production the present month brought the announcement of a new source of demand for lumber for

army uses. This involved the supply of three hundred million feet of southern pine for the erection of portable knock-down houses for the use of American troops in France as barracks and hospitals. This undertaking of itself contemplates immediate lumber requirements half as great as those of the encampment construction and adds new pressure to the demands on the industry.

The plans of the War Department architects provide for houses to be made up in panels, shipped across the sea in knocked down condition and bolted together by the soldiers in France. Co-operation between government and manufacturer was exemplified by important changes in specifications after a conference of the lumber interests with representatives of the War Department. The original plans called for the manufacture of the panels by the lumbermen. By pointing out that this was a work with which they were unfamiliar the manufacturers convinced the government that it was better that they should confine their efforts to producing the required material. This will be done and the lumber delivered to contractors who will pursue the structural feature of the work.

The need for these houses arises from conditions similar to those which make it necessary for this country to send regiments of foresters and woodsmen to the French war zone. Labor for construction purposes is practically unobtainable in Europe. With the ready-made houses the soldiers may provide their own shelter. Every phase of the work will be in standard units which will make it possible for the men to erect quickly buildings ranging in size from the one-room shelter house to a hospital accommodating hundreds of patients or barracks for thousands of soldiers.

The speed with which this new requirement for material will be met will be in keeping with the record established in providing lumber for the army camps.



The rapidity with which the camps were constructed is almost beyond belief. At Fort Sheridan, in preparation for the officers' training camp, 86 buildings were erected in 10 days. At Fort Oglethorpe 135 buildings were put up in 12 days. Without highly organized efficiency in the lumber and building industries these records would have been impossible.

This construction program, through sheer magnitude, appeals to the imagination and concentrates public gaze on this particular form of the demand now being met by the lumber industry. Less spectacular, perhaps, but of no less importance, is war's demand for forest products in other directions. Consider the case of the wooden packing box. With none of the romance attached to the magic cities that have sprung up for the army camps and lacking the glamor of building a thousand ships, the packing box is playing a vast part in the lumber requirements of wartime. The material used for making boxes for army and navy supplies has already run into hundreds of millions of board feet and the demand will continue as long as there are an army and navy to provide with supplies. Other huge quantities of packing cases are required for the packing and transmission of munitions and these likewise are consuming lumber in tremendous volume.

In the building of army transport wagons is another field for the use of lumber in large amounts. The vehicle of this type must be a model of strength and service and into its construction must enter the best grades of pine, oak and hickory. A good many thousand army transport wagons are now under construction and the demand from this source will last indefinitely.

When it comes to the actual instruments of warfare the products of the forest enter largely into the needs of an army. Without charcoal it would be impossible to make the black powder which is used in such quantities in explosives, especially shrapnel. Rosin is another item which has made itself indispensable. This product of the pine forests of the South is used by thousands of barrels in the making of shrapnel, for the purpose of holding the bullets in position in the explosive shell head. The manufacture of high propellant explosives requires great quantities of acetone and alcohol, both of which are products of wood distillation. From the refuse of pulp mills science procures muriatic acid, sulphuric acid and chloroform. Wood pulp itself has so many uses as to make them difficult to specify. During the war it has found its place in the manufacture of paper shirts, vests, socks and handkerchiefs, blankets, clothing padding and kindred uses. In Germany wood cellulose is extensively used instead of cotton in the manufacture of gun cotton. Wood pulp is even being utilized in considerable volume in the manufacture of a substitute for cotton for surgical purposes and in making tough paper for surgical dressings and paper board for splints.

In other words, an army depends on forest products from the time its men are mobilized in encampments until

the wounded have received the attention of the surgeon. The National Lumber Manufacturers' Association makes the statement that the first twelve months of America's participation in the war will probably see as much as three billion feet of lumber used for purposes of national defense. This is for construction purposes, and to these figures must be added the large quantities used for incidental requirements. The figures are startling but in spite of their size they represent less than seven per cent of the normal annual lumber production of the United States. In timber resources and manufacturing facilities the lumber industry can take care of all ordinary demands and supply the timber needed for war purposes.

The abnormal need for lumber will not end with the war. When peace shall have been established building material in tremendous volume will be needed for reconstruction of ravished Europe. Coincident with this will be the resumption of normal building operations in England which have been checked by the war. Already the British Government is considering housing plans to relieve the congestion now existing. It is figured that the country will need to erect from half a million to a million new houses within the first two years after the end of the war. Since 1906 there has been a steady decrease in the building of houses for working men. With the outbreak of the war there was practically complete cessation of even the diminished activities in this line, excepting in munition manufacturing areas. To make up for the deficiency it is believed that the government will provide financial assistance for house building on a mammoth scale.

One phase of the patriotism of the lumber interests was manifested in a campaign recently conducted throughout the South by speakers organized by the Southern Pine Association. To stimulate the woodsmen to the expenditure of their best effort in speeding up the production of timbers for the Emergency Fleet these speakers canvassed the entire southern lumber area and spoke before workers at sawmills and logging camps. The appeal to the men was based on the vital need of America for wooden ships and the importance of supplying structural material as quickly as possible. A poster displayed throughout the lumber regions said: "Every swing of an ax, every cut of a saw, may score as heavily as a shot fired from the trenches. Help our boys in France. Help them win the war." As a result of the speeding-up campaign it was expected to increase the output of ship timbers from 850,000 feet a day to 2,000,000 feet.

**MISS** Grace Pickens is taking the course of forestry at the University of the State of Washington. She entered at the opening of the current session. Other women have registered for selected forestry courses in the University, but Miss Pickens is the first to specialize in a work that has been considered a man's calling. She is from La Grande, Oregon, and has spent much of her life in the woods.

## FORESTERS AND WOODSMEN IN WAR WORK

**A**LLIED leaders in Europe have given cordial welcome to the first contingents of American foresters and woodsmen to arrive in the war zone and take up service in the forests of France. The first arrival was the 10th Engineers (Forest), which went oversea in August. This regiment was followed in November by the first and second battalions of the 20th Engineers (Forest). By French and British war leaders these men are looked upon as a vital contribution on the part of the United States to the allied cause in the great conflict. The requirements of the fighting forces in the way of timbers for trench building and lumber for other forms of construction are such as make these trained workers indispensable to military success.

No figures are available as to the amount of timber which has gone into shoring up trenches and dug-outs, into the building of miles and miles of trench sidewalks and corduroy roads and into artillery and trench screens. Nor is it possible to estimate the quantity used in railroad and bridge construction and in the building of warehouses, barracks, hospitals and other structures. Experts agree that it totals many millions of feet along the hundreds of miles of front. From the statement of a French colonel it is learned that as high as thirty thousand trees have been used in a single day by one French army corps alone. This emphasizes the worth of the American Forest regiments, which will be charged not only with supplying timbers for military use but with producing the material along such lines as will best serve the purpose of perpetuating the French forests.

Along a part of the French front white fir will be the principal timber available for the use of the American regiments. This fir is described as of good quality and fairly good stand, resembling the balsam of the American northwest. It grows in a region of good roads and comparative ease of logging operations. In another section the timber is akin to Norway pine, but with smaller yield per acre. Elsewhere is found short leaf pine, somewhat

like Florida pine in size and yield. Operations in this timber will be conducted in swamps and sand. In some places the American forces will find such hardwoods as beech and oak, of growth smaller and thicker than the hardwood timber of the western Appalachians.

Mid-December found the third and fourth battalions of the 20th Engineers (Forest) completely recruited and organized for service in the war zone. No definite announcement is made as to the time of embarkation for France, but it is understood that in line with the general policy for the formation of the regiment the two new units will soon be at work in the French forests.

Each battalion of the 20th contains three companies of 250 enlisted men, a large proportion of whom are foresters, woodsmen and sawmill workers. When the ranks of the third and fourth battalions had been filled there was a considerable overflow of available men and these are being utilized in the formation of the fifth and sixth. It is probable that two battalions will go forward each month until the full strength of the regiment is completed. This will require ten battalions of the character of those already organized. To increase the efficiency of the trained workers in these battalions the regiment will also have nine service battalions, composed of laborers. The aggregate strength of the regiment will be close to 17,000 officers and men, making it the largest regiment in the world.

Col. W. A. Mitchell, U. S. A., is in command of the

regiment and is in charge of the work of organization at American University campus in the District of Columbia. Colonel Mitchell has had broad experience which qualifies him admirably for the leadership of this force. His work has included road building in the Philippines, mapping at Fort Leavenworth and the designing and construction of dams in the Ohio river. He has served as instructor and assistant professor in military art and civil engineering at West Point. With the outbreak of the recent Mexican trouble he was sent to Arizona with a view to taking over Mexican railway operations if the

### ONLY A VOLUNTEER

By a Private in the 20th Engineers (Forest).

**W**HY didn't I wait to be drafted  
And led to the train by a band?  
Or put in a claim for exemption?  
Oh! Why did I hold up my hand?  
Why didn't I wait for the banquet,  
Why didn't I wait to be cheered?  
For the draftee receives all the credit  
While I only volunteered.

But nobody gave me a banquet,  
And never a soul a kind word.  
The puff of the engine, the grind of the wheels  
Were all the goodbye that I heard.  
Then off to the training camp hustled,  
To be trained for a good half a year,  
In the shuffle, abandoned, forgotten;  
I was only a volunteer.

Perhaps some day in the future  
When my little boy sits on my knee  
And asks what I did in the world war,  
As his big eyes look up to me,  
I will have to look into those eyes  
Which at me so trustfully peer,  
And tell him that I wasn't DRAFTED  
But was only a volunteer.



KIT INSPECTION AT CAMP OF THE FOREST REGIMENT

Some members of the 20th Engineers (Forest) at their camp at American University, District of Columbia. The picture shows how foresters, woodsmen and other civilians have been transformed into real soldiers in a short space of time. The officers are Captain C. B. Cutting and Second Lieutenant L. B. McDaniels. These men will soon see service in the War Zone.

occasion required. His selection as commander of the largest regiment affords opportunity for the exercise of his unusual executive ability and his skill in handling men and engineering problems.

Major James E. Long, Engineer Officers' Reserve Corps, has had the responsibility of purchasing equipment for the forest regiments. Major Long is a St. Louis man, with broad experience in the management of sawmill and logging operations. In his work on the staff of the chief of engineers his special training and knowledge have been of much value in preparing the forest forces for their work in France. One instance of the thoroughness of his work is the systematic method of making shipments for the regimental equipment. Each battalion is furnished with complete outfit for sawmill and logging operations. For sending these forward Major Long devised a plan through the operation of which every part and accessory is given a number and everything for one battalion is painted a distinctive color. This will make the work of assembling the equipment comparatively simple and will save much confusion.

Each battalion will be provided with four sawmill units. Two of these will be semi-portable, complete with edgers, trimmers, 100 horsepower boilers and other equipment, and will have daily capacity of 20,000 to 30,000 feet. Two of the units will be portable, with 60 horsepower boilers and with daily capacity of 10,000 to 18,000 feet. Each battalion will also have two 25-horsepower gasoline tie-cutting tractor units, for sawing ties in thin and scattering timber. Each of these units will have a capacity of 4,000 to 5,000 feet. In figuring capacity the ten-hour day is used. This will be materially increased, as each unit will have a portable electric light-

ing plant and operations will be conducted twenty-four hours a day.

After recent shifting the officers of the 20th are as follows:

Regimental Headquarters—Colonel W. A. Mitchell; Major Edwin H. Marks, Acting lieutenant colonel; Major William C. Moore, M. R. C., regimental surgeon; Captain H. L. Bowlby, adjutant; Captain P. E. Hinkley, regimental supply officer; First Lieutenant Cornelius W. Smith, chaplain.

Camp Headquarters—Major Benjamin F. Wade; Captain Edward H. Sargent, adjutant; First Lieutenant Gilbert C. Eastman; Second Lieutenant Richard L. Hyde.

First Battalion Headquarters Detachment—Major E. E. Hartwick; Captain Leon M. Pill, adjutant; Captain H. B. Campbell, engineer officer; First Lieutenant L. J. Freedman, supply officer. Attached—Captain F. M. Bartelme, regimental engineer officer.

Company A, First Battalion—Captain, Arthur W. Elam; first lieutenants, Germain P. Graham, Duncan P. Shaw and James C. Williams; second lieutenants, John B. Cuno and Roy L. Chaffin.

Company B, First Battalion—Captain, Robert A. Cutting; first lieutenants, Harold C. Lyons, William A. Clark and Thomas W. Poindexter; second lieutenants, Arthur N. Dripps, Cecil B. Bradley and Angus I. Ward.

Company C, First Battalion—Captain, H. W. Boetzke; first lieutenants R. N. Benjamin, W. J. Wilson and J. Leroy Wood; second lieutenants Hollister Johnson and H. T. Hopkins.

First Battalion Medical Detachment—First lieutenants Robert B. Hill, M. D., Lloyd A. Elliott, M. R. C., and Charles P. Hatrick, D. R. C.; second lieutenant, Julius A. Herbott, V. R. C.

Second Battalion Headquarters Detachment—Major Samuel O. Johnson; Captain Fred F. Spencer, adjutant; Captain Fred F. Horstkotte, engineer officer; First Lieutenant Mark R. Ethell, supply officer.

Company D, Second Battalion—Captain, John C. Perry; first lieutenants, William H. Crosson, Roy W. Pilling and Lawrence R. McCoy; second lieutenant, Myron H. Grover.

Company E, Second Battalion—Captain, W. D. Brookings; first lieutenants W. D. Volk, C. C. Kelley and F. R. Prince; second lieutenant, E. S. Brush.

Company F, Second Battalion—Captain, James C. Long, first lieutenants, Edwin D. Woodruff, Marion Nine and Walter O. Crosby; second lieutenant, Maurice L. Johnson.

Second Battalion Medical Detachment—Captain, J. H. Swafford, M. R. C.; first lieutenants, W. A. Fair, M. C., and R. H. Rowdybush, D. C.



Third Battalion Headquarters Detachment—Major, Arthur W. Corkins; Captain, Winthrop H. Estabrook, engineer officer; Captain Oliver J. Todd, adjutant; first lieutenant Charles M. Jenkins, supply officer.

Company A, Third Battalion—Captain, Collin E. Clark; first lieutenants, Harold M. Power, Jay H. Price and E. B. Hamilton; second lieutenants, Earl B. Birmingham and Albert L. Shellworth.

Company B, Third Battalion—Captain, Earle P. Dudley; first lieutenants, Herbert L. Holderman, Alexander H. Ellison and Morton Van Meter; second lieutenant, Fayette L. Thompson.

Company C, Third Battalion—Captain, George G. Steel; first lieutenants, Clement C. Abbott, Frederick B. Judge and Fred A. Stone; second lieutenant, Charles J. Davis.

Third Battalion Medical Detachment—Captain, Frederick C. Moor, M. R. C.; first lieutenants, Harold T. Antrim, M. R. C., and Edward S. Bracken, Jr., D. R. C.

Fourth Battalion Headquarters Detachment—Major George H. Kelly; Captain Winfield D. Starbird, engineer officer; Captain Edwin C. Wemple, adjutant; First Lieutenant Paul D. Mackie, supply officer.

Company D, Fourth Battalion—Captain, R. B. Carter; first lieutenants, W. G. Conklin, Ralph H. Faulkner and Alfred D. Kettenbach; second lieutenant, Fred A. Roemer.

Company E, Fourth Battalion—Captain, Andrew J. Fisk; first lieutenants, Lester W. Jacobs, Henry F. Power and Frank Mize; second lieutenants, Luther B. McDaniel and W. A. Foster.

Company F, Fourth Battalion—Captain, Stephen C. Phipps; first lieutenants, William G. Howe, John Summerset and Milton Pittman; second lieutenant, Harry H. Miller.

Fourth Battalion Medical Detachment—First Lieutenants Leroy A. Schall, M. R. C.; Joseph C. Kimball, M. R. C., and John W. Snyder, D. R. C.

Discussing the men of the United States Forest Service who have gone into the Forest Regiments and other branches of the armed forces, Assistant Forester William

L. Hall declares that no other class of men in civil life, perhaps, was more nearly ready for military service than were the foresters and the men employed in state and federal field work. "These men had the preparation which came from years of field experience," says Mr. Hall. "They had all manner of problems to deal with and every kind of emergency to meet. They had been subject to shifts on short notice, with new assignments involving difficult problems and unknown conditions. Above all, they had the spirit of service and esprit de corps. They were fit, ready and anxious to do their part. All arms of the military service have absorbed men from the Forest Service. Our records show 214 men now in the army or navy, and the records are probably not complete.

"The Forest Regiments offered unusual opportunities which Forest Service men and others were keen to accept. More were qualified than could be commissioned. In the organization of the 20th the War Department appears to have reached the conclusion that the qualifications called for are principally experience in sawmill work and logging. If this decision holds, there will be only limited opportunity for foresters in the later battalions. But foresters and men of thorough Forest Service training are equally well prepared for other branches of the military service. Especially are they qualified to take their chances in the National Army.



IN CAMP WITH THE TWENTIETH ENGINEERS (FOREST)

Foresters and woodsmen in the Forest Regiments have occasion to show their skill at light housekeeping as well as in the activities of the woods. These are men of the 20th engaged in dish washing after mess at the American University, District of Columbia. The sturdy appearance of the men augurs well for the regiment's success.





MAJOR E. H. MARKS



MAJOR B. F. WADE



MAJOR A. W. CORKINS



CAPTAIN E. H. SARGENT

SOME OF THE OFFICERS OF THE 20TH ENGINEERS (FOREST)

*Photographs Harris & Ewing, Washington, D. C.*

Some have felt that the draft is, if possible, to be avoided; that it shows a better spirit to volunteer; and even that it is something of a reflection on Forest Service men of good experience not to be given commissions at the start.

"This point of view is wrong. The nation has established the selective draft as the approved method of raising its army. After December 15, men of draft age will no longer be accepted as volunteers. The test of real patriotism is whether we accept willingly the nation's approved plan and without halting or question take our places in the program. Forest Service men, when they clearly understand the situation, will accept the situation not only willingly, but with enthusiasm. Under the

new instructions governing the selective service we know the class into which the necessary employees of the Forest Service will fall. When that class is reached we must expect that our men will go and we must make preparation against that time. Our part, if we are within conscription age, will consist in preparing ourselves for that service. If we are not within conscription age, our part will be to help carry the work so that the absence of those who go will not prove a vital loss."

At the offices of the Forest Service it is declared that there may be much difficulty in procuring information about the work of the Forest Regiments in France. In reply to requests for articles descriptive of the operations Major Greeley, who is with the Expeditionary Forces in



AT HOME WHEREVER YOU MAY PLACE THEM

These men of the 20th Engineers (Forest) are shown waiting their turn at the hot water tubs at American University camp. Military men who have seen the Forest Battalions in drill and other work declare that they are as fine a body of men as the army has ever assembled. The outdoor life of the forester and woodsman is reflected in the physical appearance of the men here pictured, who are typical of the regiment.

France states that the censorship makes it almost impossible to send out any information of real news value. Indirect accounts received at the offices of the Service, concerning a letter to the family of one of the men of the Tenth indicate that the regiment has already had its trials. The trip across the ocean was long and exceedingly rough. Many of the men suffered severely from seasickness. Some of the biggest and huskiest had the worst time. The regiment reached France during a spell of bad weather and was exposed to steady rains for several days without an opportunity to dry things out. As a result, some of the men were on the sick list with various minor ailments. They were, however, in a hospital located at a comfortable chateau and were being well cared for. From all accounts the little English-French dictionaries are being worked overtime.

It is understood that the regiment is quartered in "billets." Word comes that "even the wood cutting camps lost in the forests of France" had a liberal allowance of turkey and "fixin's" sent them for Thanksgiving. This probably refers to the Tenth, although "lost in the forests" is not to be taken too literally. According to a bulletin of the Forest Service it has become plain that meeting the needs of the Forest Regiments for sweaters calls for swift and large expansion of the knitting work. Colonel Mitchell, of the Twentieth, has requested immediate delivery of 1,300 sweaters and 1,600 comfort kits and other articles. The Woman's Committee for the Tenth and Twentieth Engineers was able to provide 123 sweaters, mainly knitted by Forest Service women. The Potomac Division of the Red Cross, which embraces Maryland, Virginia and the District of Columbia, with their great camps, was able to add 677. Thousands more will be needed for the Twentieth within the next two months.

The Lumber and Forest Regiments Relief Committee gave \$600 for the purchase of wool which will be knitted into sweaters for the men of the Tenth and Twentieth Regiments.

Major William B. Greeley writes from France under

recent date and makes earnest appeal for sweaters for the men of the regiments. He says that the garments are badly needed and that mufflers are also in urgent request. The mufflers are wanted particularly for men engaged in driving motor trucks and similar occupations involving exposure.



MAJOR JAMES E. LONG

hang it up while it is wet will cause it to pull. Added tidings of the need for sweaters comes from other sources. Captain Inman F. Eldredge, Company B, Tenth Engineers (Forest), writes from the war zone as follows:



BREAD WAGON OF FOREST REGIMENT

This is a camp scene of daily recurrence at the camp of the 20th Engineers (Forest) at American University. The bread wagon is on its welcome round distributing supplies from the regimental bakery. It is safe to assume that the wagon will be no less welcome when the men reach the war zone.

"Chaplain Williams has just notified me that the ladies of the Forest Service and the Red Cross are prepared to furnish sweaters, scarfs and wristlets to the men of this command who have none. Owing to the rough nature of the work in which our men are engaged, scarfs and wristlets would not be of great service and we would feel that we were taking them from other men who might make better use of them. For sweaters and heavy socks, however, we have a real need and the soldiers will be able to make good use of them. If they can be supplied we have need for

100 sweaters and at least 200 pairs of heavy knit socks. Socks particularly are needed, since during the coming winter many of our men will be working in a wet country."

Chaplain Williams is commissioned as a lieutenant with the Tenth. He writes: "We have just arrived in our permanent camp. It has been very cold and the sound of

sweaters in the making has been received with great joy. We are so near to the fighting line that we can hear the guns booming away when it is at all quiet.

"I am enclosing the names of the men in Companies D and F that desire sweaters, all of them being men who do not possess such articles and who have signed up for the same. I have written the captains of the other companies to send you similar lists for themselves, and I think it would be well if it could be done, to send the articles for each company direct to it. We have not requested scarfs or wristlets believing that men in other forms of work could use those articles to better advantage."

Impetus was given enlistments in the Forest regiments late in November by the announcement of the chief of engineers that after December 15 no man of draft age could voluntarily enlist. Accompanying this announcement was a statement calling attention to the advantage of skilled men enlisting before the expiration of the time limit in order that they might select the organizations in which they preferred to serve. "By doing this," said Major General Black, chief of engineers, "each man can render his country a greater service than by waiting for the draft and can also be placed where his experience and training will make the service better and more profitable for himself."

In addition to its contributions of men to the Forest Regiments the United States Forest Service has been called upon for various forms of activity in connection with war work.

During December there were demands for lumber

men in the aviation corps of the army. These men were wanted for service in 12 large construction squadrons being organized at the barracks at Vancouver, Washington. The woodsmen thus enlisted were for work in connection with the timber needs for airplane construction. It is probable that men from the Service and lumbermen will be needed as officers.

The Signal Corps has asked for assistance in the preparation of purchase specifications for propeller woods. The primary object is to reduce handling through a right selection at the source of supply.

The Forest Products Laboratory of the Forest Service, upon the request of the American Bureau of Shipping, is now revising the rules of the Bureau governing the use of wood in ships. The Bureau of Shipping is an organization representing shipbuilders, ship owners, and marine insurance companies, like the Lloyd's Agency in England. Its classification of ships governs the rating on which insurance depends; hence its rules have a very important influence in all shipbuilding in the United States. The present building program of the Emergency Fleet Corporation is governed by the rules of the Bureau practically in the same way as is construction for private corporations. The Forest Service will therefore exercise an important influence upon the technique of the emergency construction.

The Forest Service has also been working with the Navy on kiln construction and methods of storing kiln-dried lumber for use in airplanes. Co-operation with the Navy has also taken the form of inspection of lumber for use in airplane construction and assistance in preparing specifications for material.

**W**ILL C. Barnes, assistant United States Forester, has returned from a five-month field trip. He reports that about 75,000 head of sheep grazed last summer on range made accessible at the head of Lake Chelan by building a barge with a capacity of 2,700 head of sheep. The barge was built by the stockmen at the suggestion of the Forest Service, and conveys the sheep from the foot of the lake to its head, about 50 miles, where they land on high summer range that could not otherwise be reached. Adjoining Canadian range affords room for additional sheep, which the Dominion authorities are willing to have admitted by the Forest Service.

**T**HREE cases of livestock losses have been reported in which the owners have suspected enemies of the Government. One sheep man in South Park lost in a single night 1,000 sheep, for which he had just paid \$14 a head. While it is possible that the reported losses were due to poisonous plants, the State Veterinarian did not find evidences of poison, but thought the loss might have been caused by contagious pneumonia. The other two were cattle cases. Forest officers have been urged to exert unusual vigilance, particularly in the matter of looking into the presence of strangers in the vicinity of ranches and on the mountain ranges.

**D**ISTRICT Forester F. A. Silcox, of Missoula, Montana, has resigned from the Forest Service to accept a temporary position as special assistant to the Secretary of Labor. In that capacity he will undertake an investigation of labor conditions in the Pacific Northwest. It is expected that after his work there is completed he will resume his regular duties with the Forest Service. Mr. Silcox had been commissioned as captain in the 20th Engineers (Forest) and was to have been called for service in a short time. He resigned his army commission in order to take up his new work.

**T**HE Forest Service was represented at the recent Portland Land Show by a forest fire exhibit, which attracted considerable attention. This exhibit showed apparatus and tools used by the Service in its fire protective work and a number of bromides showing the effects of uncontrolled forest fires.

**T**HE Forest Service will again co-operate with the Weather Bureau in keeping a record of snowfall on the National Forests this winter. Snow stakes will be read by rangers at frequent intervals. From the data obtained the Weather Bureau is able to approximate stream flow in the region for the succeeding summer.



# A PROBLEM OF EROSION

BY R. S. MADDOX

FORESTER, TENNESSEE GEOLOGICAL SURVEY

**B**ECAUSE of the problems involved in forestry, Mr. Whittle's article in *AMERICAN FORESTRY* of August, on erosion, is of more than passing interest. He shows pictures of and describes eroded lands containing gulches 200 feet deep still eating back, undercutting and devastating both agricultural and forested lands. Erosion is a big problem and in some sections, particularly in the South, a serious one. On the debit side of our nation's account are being written down in nature's book huge losses not only from our forests, but also from our tilled lands. New fields are being constantly cleared to take the place of once cultivated fields now turned out as waste. Much of this newly cleared land is eroding in its turn and the cycle of destruction goes on. Certainly there must be a halt to this process if both or either of these natural resources of land and timber are to be maintained.

But while the erosion question is of most vital importance, the writing of this article was called forth because of the way in which Mr. Whittle handled his subject. Of the encroachment of eroded lands discussed by Mr. Whittle, he said: "Only one staying hand has been lifted—the dark pine forests that grip the earth with strong fingers and resolutely confront the dragons of the caverns. Where the forest is weak the chasms have pulled it down. Where the forest is strong the caverns give up the struggle. Man

has taken cognizance of the combat and given his only aid to the struggle against erosion; he has learned to let the forests alone where the gorges encroach. To plant a forest athwart the line of approach has seemed futile to the farmer landowner. He realizes how long it takes to grow a forest and how formidable it has to be to withstand the undercutting of the persistent force. So that once the gorge has invaded, the farmer abandons hope of ever again bringing the land under agricultural subjection, so forbidding are the rough, steep slopes and so narrow and tortuous the bottoms of the gorges."

Whether Mr. Whittle expresses his own views or those of the landowners, on that phase of erosion is uncertain. There is, however, room for open discussion of such a

large subject. Without confuting his statements, it is practically if not wholly impossible for such large gulches to be held in check by forests at their heads. The root system of the trees extends into the ground only a short way compared to the depth of the steep, bare banks, and the undercutting will eventually cause the forests to topple over until by a catching up and filling in of the soil below there is an adjustment made between the erosive forces and the declivity of the banks, thus stopping the running-off process. The steepness of the banks is proof that the washing dirt has been carried away practically as fast as it comes down. It is not sufficient to depend upon the forested areas at the heads of these eroded lands to check the waste. Mr. Whittle

did not state whether the trees growing up from the bottoms of the gulches were now blocking the passing out of the dirt constantly washing in from the sides. If this dirt is caught and held by those trees, eventually, even if left alone to nature, a slope between the bottoms of the gulches and the top crests will be established and covered with vegetation. If the dirt passes out freely through the gulch so much the longer will the slope be in forming. But in either case, dirt must come from the banks before this final, fixed slope, as it might be called, is obtained; and during this making process it is necessary to sacrifice more and more of the forests and agricultural land



RECLAMATION OF GULLIED LAND

The dam was built in September, 1916, in Weakley county, Tennessee, and the black locusts shown were planted in the spring of 1917. The photograph was taken in July, 1917.

on the top of the banks until the adjusted slope is a result, unless man can come to the rescue.

To hasten the process of adjustment, the washed down dirt must be caught and held, that is, its running away must be checked. This helps to raise the bottom level of the drains and also provides stable soil on which to start permanent growth. It is next to impossible to get a growth started on a constantly shifting or moving soil. If some of the trees growing in these gulches were used in making temporary dams, then some permanent growth could be set out on the dirt caught by them in order to constitute a permanent dam. Black locust bushes, Bermuda grass and honeysuckle vines are excellent for this purpose and would no doubt be of





COMPARE THIS WITH THE NEXT PHOTOGRAPH

No. 1.—An area of eroded land, seemingly a hopeless waste, but really in process of reclamation, in Carroll county, Tennessee. Dams were built in the fall of 1915 and the photograph was taken in November of the same year.

much service in handling the problem discussed.

It is a wrong idea to abandon land simply because it cannot be brought back to produce crops from tillage, if this is what Mr. Whittle means by "bringing the land under agricultural subjection." Nor is it right to think trees are valueless and doing no good because they can not be marketed profitably. The slopes finally resulting from the reclamation of these severely eroded lands might be so steep as to be impossible of or impracticable for cultivation. But if trees should hold these slopes

and prevent further erosion and encroachment on valuable forests and agricultural lands above, they would command a value in themselves not to be estimated. Even though trees on such slopes and gulches were very costly to handle either for farm uses or for the market, there is a probability that the demand for timber will, after a while, give them a money value in addition to their worth for protecting lands above and checking rapid drainage.

Published herewith are photographs showing an erosion problem and how it is being handled in Tennessee.



THE RESULTS OF RECLAMATION PLAINLY TO BE SEEN

No. 2.—This is the same area as shown in No. 1, in Carroll county, Tennessee, but it was set out in black locust in the spring of 1917. The large trees in the lower left-hand corner were set in the spring of 1916, above the dam shown in No. 1 in the same location.

They give an idea of the effect of planting black locusts above temporary dams so as to form a permanent dam to hold the dirt as it crumbles from the banks above. It is plain to see that after a while the banks will round off and will contain a growth of value, and the erosion will be stopped. The banks, however, must pay the price of this rounding off process. There is no other solution

unless the dirt for filling be hauled, which in such cases is wholly impracticable. The gullies in the above cut are not so deep or so steep as those Mr. Whittle describes, but the principle in each is the same, and could man aid nature, much could be done to save the forests, forest and agricultural land in the South, the destruction of which is now taking place.

### FREE TREES FOR PENNSYLVANIA

**N**O limit will be set this year by Pennsylvania on the number of forest tree seedlings for free distribution, says Commissioner of Forestry Robert S. Conklin. Any one who wants to plant trees next spring may have them for the asking. No strings are tied to the offer, the only conditions being that applications for less than 500 trees will not be filled, applicants must pay for packing and transportation, and the trees may not be sold but must be actually planted in Pennsylvania for reforestation. No applications can be filled for ornamental trees.

The State Forest nurseries have raised more trees this year than ever before, but so many of the foresters have enlisted and so few laborers are available that the number to be planted on the State Forests probably will be even less than last year. Over 10,000,000 trees are ready to set out next spring, and as many more are in the nurseries, but are too small to plant next year.

The stock available for free distribution is almost all three years old, and includes white pine, Scotch pine, red pine, pitch pine, Norway spruce, European larch, Japanese larch and red oak. It is of better quality than any sent out last year.

### FORESTRY PRIZE AWARD AT CORNELL

When the new Forestry Building was opened by the New York State College of Agriculture at Cornell University in 1914, Charles Lathrop Pack, of Lakewood, N. J., widely known as a leading conservationist, who has been closely associated with the development of forestry along the most advanced lines, made contribution of \$500 to the Forestry Department for use in its work. The money was deposited with the university treasurer for investment, the annual income to be used "in the interest of forestry." This amounts to a little over \$20, and the faculty has decided that its best use is to give an annual prize to the student in the Forestry Department who has made the best record for the year both in his studies and in his general attitude toward the work. This disposition of the money by the faculty strikes us as a wise one, for it gives that little additional spur to personal incentive lent by competition, and makes it more interesting for the boys. The prize for the past year has been awarded and the winner was Samuel C. Sweeny, of Hartsdale, N. Y., a senior in the Department of Forestry. Mr. Sweeny is now in the South at one of the operations of the Bogalusa Company, getting his three months practical experience in a logging camp, which is part of the course in forestry at the New York State College of Agriculture.

### A BALLAD OF THE TIMBER CRUISER

BY LEW R. SARRETT

**Y**OHO! Yoho! Yoho!  
You whistlin', bristlin' blizzard,  
A-sweepin' timber low,  
You buckin', blust'rin' roarer  
With your whirlin', burlin' snow!

You're snatchin' at my whiskers,  
And you're rippin' at my clothes,  
You're pawin' at my duffle-bag,  
And you're bitin' at my nose.

You've swallowed up the balsams  
With your blindin', grindin' drift,  
You've sheeted up the rapids,  
And you're workin' double-shift.

You've bluffed the lop-eared rabbit;  
Squirrel's prayin' for his soul;  
Doe's shiverin' in the tamaracks;  
Mink's popped into his hole.

Tho you've scared the whole blamed outfit,  
I'll call your brawlin' bluff—  
Here's to you! Blast and Bluster!  
Man's made of tougher stuff.

**Y**oho! Yoho! Yoho!  
You howlin', growlin' Norther,  
A-roarin' as you go,  
You rippin', tearin' bully  
With your icy clouds and blow!

**P**PAPER blankets have been made, in every way as effective as 5-pound wool blankets, and only one-tenth as heavy.

**T**HE locust which is too small for fence posts may often be sold for insulator pins and brackets for telephone and telegraph lines.

**T**HE government is reported to have reached a decision that tree nails or wooden pins used in ship-building must be of locust or eucalyptus. The black locust will be the particular species used. This is a good fast-growing tree for New York if it can be properly protected from the locust borers.

**S**HUTTLE factories and other manufacturing plants use more than seven and one-half million feet of dogwood annually in this country.

# LANDSCAPING AND FORESTRY

BY SMITH RILEY

DISTRICT FORESTER

**D**O foresters need a knowledge of landscape engineering? Should the forest schools teach this subject?

It has been the fashion to consider the practice of forestry as tree culture upon a vegetable garden basis with every foot of space devoted to the production of wood.



SECTION OF PROPOSED ADDITION TO COLORADO NATIONAL FOREST

View in midwinter of Big Thompson River and Loveland—Estes Park auto road, with forest and cliffs in distance. Plans should be drawn to recognize careful preservation of all natural values along forest roads.

The forester has been called a lumberman who cultivates trees for volume production. In urging the creation of National Parks from National Forest areas, many have attempted to define a wide difference in the character of these areas by defining the limits to which a forester will practice his profession.

A forest, be it state or private, will always be recognized for its esthetic values. This has been demonstrated in all older countries where forests have been preserved and cultivated for centuries. We should then proceed upon the basis that it is a part of the profession of a forester to cultivate to the highest sense the values of lands

devoted to the production of trees. While this is true in the case of private forests, it is doubly true in the development of both State and National forests. Such areas devoted to forest culture will ever have a high value and be used to impart new vigor and life to toiling mankind. Such areas will also be recognized for their educational value in developing the bodies and minds of children. Can we say then that esthetic values should be ignored?

In the National Forests a forester deals largely with development in natural settings. The State Forester and in some cases the private forester deals with lands where the natural settings have been destroyed and



HORSE THIEF TRAIL ON THE UNCOMPAHGRE

Already a beautiful trail, but one which offers a splendid opportunity for constructive landscaping—to bring out values which will make it a joy to travel, even by the most unobserving.

must be recreated. In either case, the forester must appreciate the existing values or the possibilities, and such appreciation can only come from a knowledge of the subject and principles.

Upon the National Forests trees are planted and trees are cut. An eye to esthetic values in planting upon a



large scale will not go amiss. Fire-swept areas are being planted upon the slopes of Pikes Peak in the interest of water shed protection for the municipal supply of Colorado Springs and nearby towns. Certain species of trees are adaptable to given exposures and the larger trees are adaptable for planting upon moving soil. What is wanted here is a quick, attractive showing to gain public

over. There are hundreds of ranger stations in the National Forests where we have studied the relation of the buildings making up the station to each other, the relation of the roads and walks to the buildings and the relation of the trees, shrubs and flowers to the whole, then the relation of the whole station to the forest setting. One can imagine that every principle of landscaping

can be violated in the development of such stations so they may prove an eyesore to every visitor or passerby, or the inmates of the station. It is a well known fact that while many have no trained appreciation of esthetic values, inequalities offend an undeveloped sense to such an extent that unfavorable impressions are received and laid to other causes. With the beautiful natural settings of these forest stations and the vast variety of material to work with in the trees, shrubs, vines and flowers found throughout these areas wherever development is contemplated, much can be accomplished.

In some of the National Forests maps have been called for showing in detail the conditions



A POPULAR TOURIST RESORT ON THE PIKE NATIONAL FOREST, COLORADO

A forest, be it state or private, will always be recognized for its esthetic values, and many can testify to the popularity of the Pike, and this resort, known as Cassells.

approval of the work being done. We may start this planting upon certain slopes offering a setting of high values so the earlier portion of the plantations will in a short time attract the eyes of all who approach the locality. In this way the attractions of the locality are steadily improved for the use of recreation and the work is realized and approved by the public at an early date.

A big timber sale has been made in the Superior National Forest in Minnesota. There are many lakes within the sale area. These lakes contain islands. In making the sale an exception is made of the trees near the lake shores and upon the islands. This action is taken to protect

the esthetic values. A keen appreciation of the principles of landscape engineering would undoubtedly make it possible to improve the esthetic values upon such islands and lake shores by the removal of a certain per cent of this timber. Such action would be very agreeable to the timber purchaser as he desires to remove the greatest possible volume of timber for the area worked



ON THE SUPERIOR NATIONAL FOREST, MINNESOTA

Iron Lake, near the outlet into Lac La Croix, showing the Canadian shore to the left. The esthetic values of the islands would be improved by removing a certain per cent of the timber.

at the forest stations. The relative location of the buildings, roads, walks, trees, bushes and flowers will be shown. The wind and storm directions are given consideration. After due study these maps will be used to make a working plan or ideal plan to be used in the future development. New buildings are needed—the plan will be followed in placing these buildings. The

dwelling at this station is poorly placed, a new one is contemplated. It will be located according to the plan. A ranger's wife takes a great interest in the beautification of the station grounds; such effort, if undirected, may result in inequalities, where if a plan covers this phase of the development, all effort will in the end result in an attractive station. Particular attention should be given to the use of native material that will not establish artificial conditions requiring constant attention. An example here would be the use of shrubs that would freeze down in unusual winter weather, necessitating the cost of replacement. Another example would be the use of flowers requiring cover in the winter or summer watering. Attention of this kind is costly, besides, the nature of the officer's work is such that attention cannot be given at the crucial moment. Upon the other hand, there are hundreds of beautiful wild flowers available for such work that will require no attention.

There are two schools of landscaping, the English and the Italian. The English school endeavors to reproduce or preserve natural effects. What more interesting field for the applica-

visited by thousands each summer. A beautiful tree has been left as a centerpiece to a car parking space. Owing to the grading necessary a large mound was left around the base of the tree. What plants should be put in here to cover the ground of this mound so there will be flowers in spring and summer, a pleasing symphony of fall colors in berries and foliage, not forgetting the



PUMA PASS RANGER STATION, PIKE NATIONAL FOREST

Showing Stoll Mountains in background and Ocean to Ocean Highway in foreground. The absence of trees between the station and road, and particularly around the house, spoils an otherwise attractive setting. Care in planning would obviate injury of this nature.



SHERIDAN RANGER STATION, IN SUMMER

A beautifully located station, winter and summer, on which thought has been expended and an appreciation of the esthetic.

tion and cultivation of this principle of landscaping can be imagined than the development and care of these forest stations?

The Forest Supervisor who cultivates a taste for landscape engineering can develop a knowledge that will be of great value to him in the administration of his forest. A camp ground has been developed upon an auto road

necessity of plants to give pleasing winter colors in buds, twigs and stems?

A summer home area is located in a canon. There are trees, conifers and hardwoods, with many varieties of shrubs scattered over the area. He who plots the lots and lays out the approach road to such an area can, by a knowledge of landscape engineering, bring to bear every factor of esthetic value. Work of this kind will make an area doubly attractive which, under an unskilled hand, would prove uninteresting to a home seeker.

A trail is needed along a ridge and to the top of a mountain.

This trail, one of the forest's network of trails, is built to make the ridge accessible for fire patrol and open a way to the top of the mountain that is to be a fire lookout point. If the man who locates this trail has a realization of the values in the grouping of natural objects—in short, if he realizes the values of this group of red fir tinged by the late afternoon or early morning sunlight,

that growth of young pine upon this angle of slope, this glimpse of a waterfall in a narrow canon backed by a group of snow peaks, this large cluster of mountain maple burdened with seed in early summer and doubly attractive in autumnal colors, this little mountain meadow or swale bright with larkspur and lupines in summer.

while vivid blue with delicate fringed gentians in early fall; I say, he who sees these values can by a turn here to the right or left, a slight climb there, bring out values in this trail location that will make it a joy to traverse even by the most unappreciative while the appreciative traveler who once

traverses its length will look forward with the greatest keenness to the time that may again place him in that vicinity to drink in its values in the same or other seasons of the year. Do not lose sight of the fact that this same ridge trail can be located and built in such a manner that the pleasure seeker will pass unnoticed many objects of beauty that could have been brought to him without additional cost in construction, a mere trail, in fact, to a fire lookout with attractive views here and there that have been brought out by happenstance.

One of the forester's problems of no little magnitude is that of paints for his signs, fire tool boxes and buildings of all kinds, what color schemes are adaptable, should these be in contrast to the surrounding colors or blend with those of the setting. There is some argument for direct contrast of color in those objects to which it is desirable to attract direct attention, such as

signs of all kinds, fire tool boxes, etc. Many colors for these purposes, such as brilliant reds, black upon a white background or the reverse, heavy browns or chrome yellow, will give contrasts that are foreign to a forest setting and are, therefore, displeasing. It is a well-recognized principle that greens and grays are the

colors to be used in applying the rules of the English school of landscaping, so the forester cannot go far wrong in using these colors which blend so harmoniously in every variety of forest setting. It will be found that a combination of luster green and pale gray or ivory white will give excellent contrast and yet pleasing

harmony for all manner of signs, in fact, such contrast for identification and harmony for setting that cannot be secured in any other colors. In selecting gray care should be taken to secure a dusky gray with a warm tint, as a cold or blue gray will give an unpleasing contrast that makes it unadaptable.

Congress has appropriated funds for the construction of National Forest roads in co-operation with the states and counties in which the forests are located. These roads will be located by the Forest Service, while the surveying and construction will be carried forward by the Bureau of Good Roads of

the Department of Agriculture. In arranging for these roads plans should be drawn providing for the recognition of all natural values along these roads looking to their careful preservation. I recall a beautiful group of yellow pine trees along a recently constructed western



A DELIGHTFUL SPOT IN THE SAN ISABEL NATIONAL FOREST

This view from Clubhouse Park shows the beautiful location of summer homes in the San Isabel Forest.



A PARTY JUST RETURNING FROM A TRIP TO THE SUMMIT OF PIKES PEAK

Along the Pikes Peak auto highway, where 3,000,000 young trees have been planted by the Forest Service in the interest of Colorado Springs' municipal water supply. It is not hard to foresee the esthetic value of the growing stand to the tourists who ascend this famous peak.



state road. The dirt of a shallow fill which might have been otherwise disposed of was placed against the base of the trees, which became weakened by lack of root air and were attacked and killed by the pine bark beetle, to remain skeletons of desolation along this otherwise beautiful road.

A previous study of values and a plan for the careful preservation in course of road construction will do much to retain many values with very lit-

tle additional cost, that will otherwise be destroyed.

There can be no question that a knowledge of landscape engineering will be of untold value to foresters doing constructive work. With the rapidly changing conditions in regard to forestry in this country, a knowledge of this subject will become more valuable to the practicing forester. I, therefore, feel that the forest schools should offer at least a short course in the subject.

## A WONDERFUL WALNUT TREE

BY V. W. KILLICK

**I**N a crisis of a walnut blight epidemic, some time ago. A. R. Rideout, of Whittier, California, accidentally discovered a single tree in the orchard of Jacob Chase, three miles south of Whittier, which showed a remarkable propensity for resisting the blight disease. Rideout leased the Chase tree for a number of years, and by budding it to seedling nursery stock, produced the first "blight immune" variety of walnuts.

Rideout's success led other men to search for more specimens of blight immune trees. A few were discovered and nursery stock produced from them. All these together have contributed to save the California walnut industry from being entirely overrun with the disease.

The Chase tree is a seedling and was planted in 1886 by a Mr. Van Vorce, who secured the seed from France. It has a spread of eighty feet and stands some fifty feet high. It is very symmetrical, a vigorous grower and prolific bearer, having produced 325 pounds of nuts last year.

As the tree has become quite a landmark to the community, Rideout has built an observation tower through



THE CHASE WALNUT, AT WHITTIER, CALIFORNIA

In a crisis which threatened ruination to the walnut industry in California, this was the tree which by careful budding produced the first "blight immune" walnuts.

its foliage. The tower is fifty-five feet high and, standing upon it, one gets a very unique view of the gigantic tree from above.

## DEAD LEAVES VALUABLE

**D**EAD leaves have a value of \$10.40 a ton as a fertilizer. Estimates Prof. Franklin Menges, farm adviser of Pennsylvania, while C. C. Logan, extension agronomist of North Carolina, declares they contain per ton 15.2 pounds of nitrogen, almost twice as much as horse or cow manure; 5.2 pounds of phosphoric acid and 8.4 pounds of potash, the total value of these plant food constituents being \$8.15.

Dr. Logan says: "It can be seen that the plant-food in a ton of fresh, dry forest leaves is worth considerable more than the plant-food in an equal amount of either cow or horse manure. In addition to this greater fertilizing value, the leaves would supply about four times as much organic material as the same amount of manure, since the latter, under ordinary conditions, contains about 80 per cent water. This organic or vegetable material is the need of practically all lawn and garden and most field soils of the state. The leaves, therefore, should be spread over such soils most in need of organic matter and be mixed in by plowing and harrowing during the fall or winter. A good rate would be 100 pounds for every 300

square feet, applied annually. If the leaves are thoroughly mixed with the soil, they will aid materially in holding water and in keeping soils moist during dry periods, thereby preventing them from running together, baking, and becoming hard. This is in addition to the goodly amount of valuable plant-food constituents supplied as seen by the table above."

Dr. Menges declares: "The composition of the leaves of different species of trees varies, but 100 pounds of leaves as they fall from the trees at this time, partly dry, contain 60 per cent water, 9 per cent nitrogen, 2 per cent phosphoric acid, 4 per cent potassium and about 2 per cent lime. A ton of leaves will contain 18 pounds nitrogen, 4 pounds phosphorus, 8 pounds potassium and about 40 pounds lime. The nitrogen, valuing it at 40 cents a pound, would be worth \$7.20, and the potassium at the same rate would be worth \$3.20. Leaving the value of the phosphorus, the lime and the organic matter out of consideration, a ton of leaves would be worth at the abnormal prices now prevailing \$10.40."

# CLIMATIC RECORDS IN THE TRUNKS OF TREES

BY A. E. DOUGLASS

DEAN COLLEGE OF LETTERS, ARTS AND SCIENCES OF THE UNIVERSITY OF ARIZONA

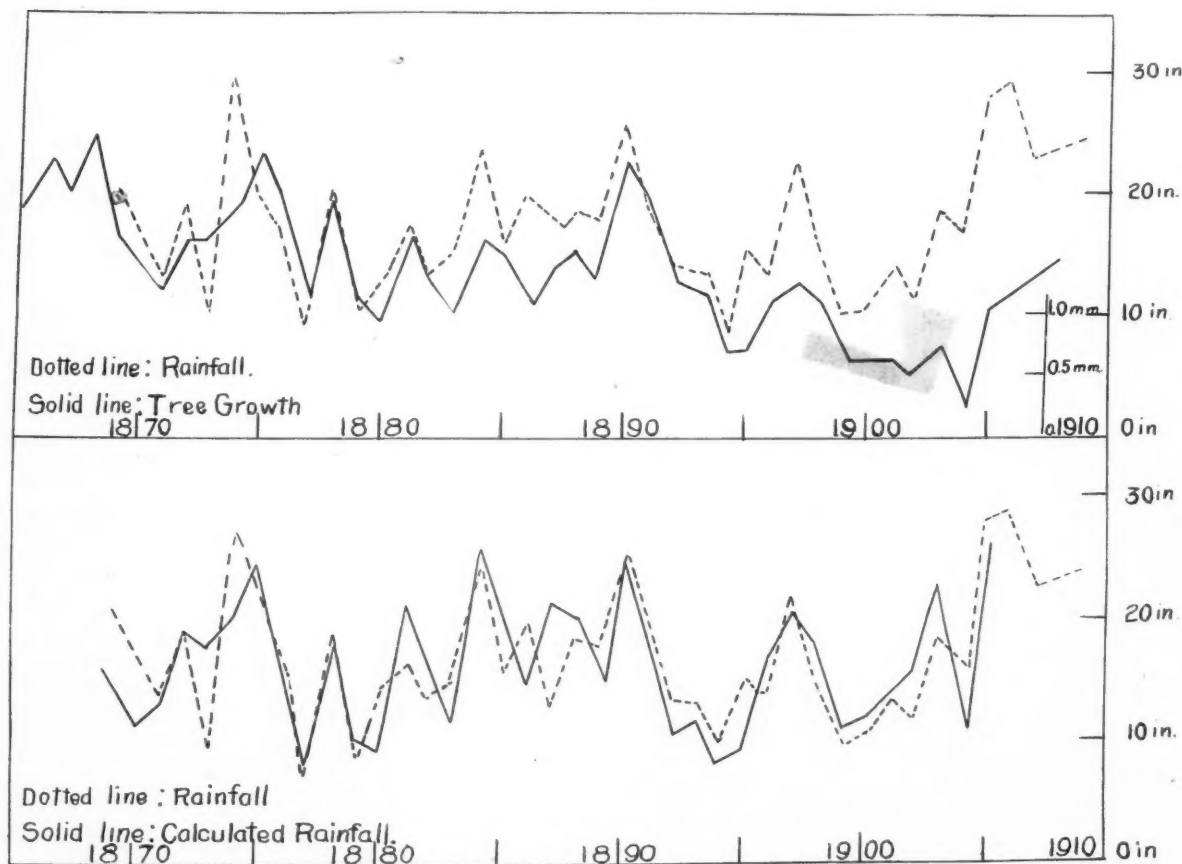
THE annual rings of trees have been found to display in their varying width a life-long record of events historically important in the life of the tree. Such events naturally have to do with favorable or adverse weather conditions, interference by competing vegetations, shade, drainage, pests, fires, and so forth. Most of these effects are well known to the forester, thus the result of forest fire is a matter of constant observation. Smoke near great iron manufactories in diminishing the rings of trees has been studied with care, and numerous interesting photographs showing it have been published by the Mellon Institute.\*

In the Geological Museum at Berlin one may see samples of pine, collected by the late Professor Potonie, some grown in upland and some in swampy ground, showing wonderfully diminished growth in the latter, due to the excess of water. The effect of drainage in wet climates is beautifully shown in a small section of *Pinus sylvestris*

in the office of Professor Jelstrup, chief of the Norwegian Forest Service, at Christiania. This little section shows 17 rings of annual growth in a radius of 15 millimeters from the center. In that year trenches were dug draining the land and allowing the soil to dry in part. The remainder of the radius of the section is 40 millimeters in width, but contains only eight rings. The growth increased five and a half times after drainage.

But in the great fundamental questions of weather conditions, nature has constructed immense laboratories over the earth, some of which isolate effect of varied rainfall in a beautiful manner. In regions where the rainfall is really deficient, the tree makes a lifelong struggle against drought and, if other accidents are largely absent, that struggle is the most prominent feature of the rings. Even if the other factors are present, we must remember that the average of a group of trees, sufficiently scattered in location, will practically eliminate

\*J. F. Clavenger, "Effect of the Soot in Smoke on Vegetation," Bulletin No. 7, Smoke Investigation, Mellon Inst., Pittsburgh, Pa.



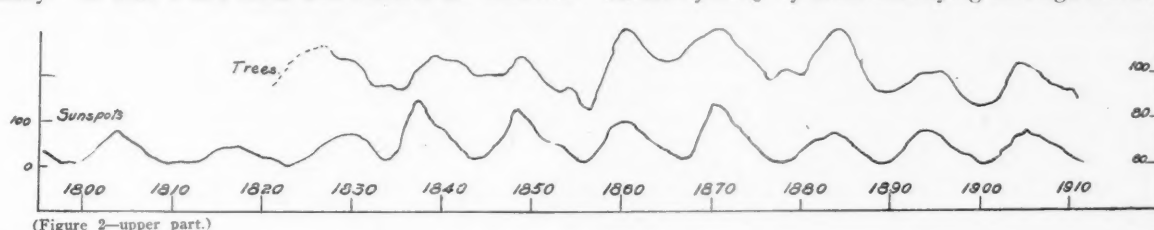
COMPARISON OF 43 YEARS OF RAINFALL AND TREE GROWTH AT PRESCOTT, ARIZONA

Fig. 1.—In the second diagram, the "Calculated Rainfall" is obtained from the Tree Growth by multiplying its value each year by three terms: First, a general coefficient changing mean tree growth to mean rainfall; second, a small factor correcting for age of tree, and third, a "conservation" factor to correct for preservation of moisture fallen in previous years. This conservation factor is very nearly the formula for "accumulated moisture" reversed.

accidents of competition, injury and so forth and that other factors such as fires, drainage and sometimes pests, which themselves depend on weather, actually exaggerate climatic effects. Hence if in rigorous surroundings we can show empirically a relation between tree growth and terrestrial or cosmic conditions, we are justified in regarding it as a genuine case of cause and effect.

Long residence in the great yellow pine forest of Northern Arizona led me to the study of that tree especially. In 1907 I had made and reduced ten thousand

trees the cross-identification was more essential, for in that region two causes operate to produce errors in ring counting; first, the strongly marked double rainy season (winter and summer) producing rarely an extra ring which resembles the annual rings; and second, the occasional series of deficient years causing some trees, in part of their growth at least, to stop ring production for one or more years. The error there of straightaway counting was found to average four per cent in the last two hundred years. By cross identifying all rings this error

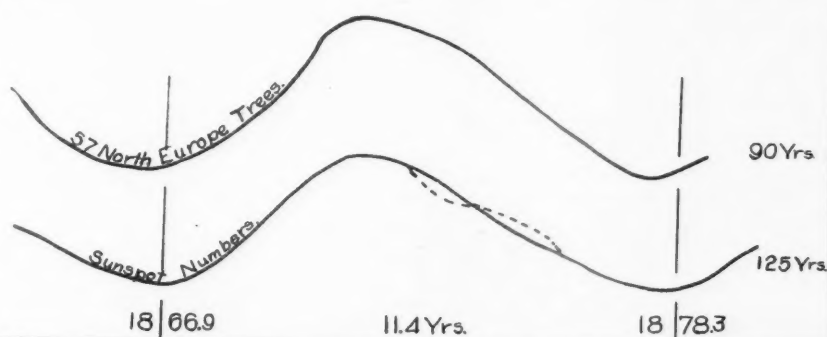


(Figure 2—upper part.)

measures upon twenty-five long-lived trees. Four years later three or four thousand very careful measures upon the last fifty years of nearly seventy different trees were added. And now I have nine thousand more

upon eighty different samples of the European *Pinus sylvestris* or common pine of North Europe. The conifers, by the great regions they cover, the great variety of climates they endure, and especially by the prominence of their rings, seem best adapted to this purpose.

Apart from care in measuring the rings, the details of which have largely been described (Monthly Weather Review, June, 1909, and Bull. Am. Geog. Soc., May, 1914, Carnegie Publications, No. 192, Chapter XI.), the most fundamental and essential feature of the method is the cross-identification of rings among a group of trees. The ease and accuracy with which this can be done in a fairly homogeneous forest is remarkable. A group of thirteen tree sections collected along a distance of a quarter of a mile in the forest of Eberswalde, near Berlin, show almost identical records. Two to ten rings in every decade had enough individuality to make them recognizable in every tree. A group of twelve sections from Central Sweden, cut, however, from logs at the sawmill at Gefle, show such agreement that there is not a single questionable ring in the last hundred years or more. Especially marked combinations of rings could occasionally be traced across Europe between the groups hereinafter mentioned. In Arizona, identification across seventy miles of country was unquestioned and even at two hundred miles resemblance was apparent. But in Arizona



(Figure 2—lower part.)

COMPARISON BETWEEN 57 NORTH EUROPE PINE TREES (smoothed) AND SUNSPOT NUMBERS

The trees are from England, Norway, Sweden and North Germany.

was reduced to half of one per cent or perhaps to zero. Recently I have made an interesting check on the accuracy of the accepted identification by noting every statement of weather, freshets or crop failures mentioned by

the historian Bancroft in his accounts of the settlements of Arizona and New Mexico. I find fourteen cases in which the noted feature of the year agrees with the tree record, and but one doubtful disagreement. The most striking correspondences occur with reference to the flood on the Rio Grande in 1680, the famines between 1680 and 1690, and the droughts in Arizona in 1748, 1780 and 1821.

The accuracy with which the pine trees near Prescott, Arizona, represent the rainfall recorded in that city for forty-three years, is, without correction, about seventy per cent (Figure 1.) By a provisional correction for conservation of moisture by the soil, this accuracy rises to about eighty-two per cent. The nature of this conservation correction is very simple, it is practically the "accumulated moisture" of the meteorologists. It signifies that the rings in these dry climate trees vary not merely in proportion to the rainfall of the year but also in proportion to the sum of the profits and losses of the preceding years. The "credit balance" in their books at the beginning of the year has only somewhat less importance than the income during the current year. One must remember that conservation in this dry climate may be very different in its action from that in wet climates where the ground is continually moist or water-soaked.

In reckoning the amount of moisture for the year



one must remember also that precipitation in the form of snow goes over to the following spring growth and should be included in the rainfall of the succeeding year. Also in regions where there is a pronounced double rainy season, heavy precipitation in winter is necessary in order to tide over the spring drought, otherwise the tree may put on a false ring (usually easily distinguishable) or even in extreme cases stop growing for the year and show no effect of the summer rains. These features are finely shown in the Prescott trees.\*

In the eighty sections recently examined or collected in North Europe a striking coincidence was found between the growth of these trees and solar phenomena (Figure 2.) That some such agreement should exist was not entirely unexpected. The question of the relation between sunspots and weather is one upon which doctors—and noted ones—have disagreed. This investigation was begun to see whether the trees, by representing the weather, would show such connection, if any exists. A very strong and very reasonable connection was found between tree growth and rainfall in Arizona. But also substantial evidence was found of a relation to sunspots. To give some idea of it one may say that in the last hundred and sixty years, ten out of the fourteen sunspot Maxima and Minima, have been followed about four years later by pronounced maxima and minima in the tree growth. Also during some two hundred and fifty years of the early growth of these trees they show a strongly marked eleven-year variation.

But in the very first group of European trees studied, those obtained at Eberswalde, near Berlin, the remarkable fact became at once apparent that these thirteen trees from one of those beautiful German forests, show the eleven-year sunspot curve since 1830 more accurately than do the corresponding curves of rainfall or temperature. The eleven-year variation in the trees is shown in the accompanying photograph of one of the Eberswalde sections (Figure 3.) It will be seen at once that there is a rhythmic sway in growth, large rings alternating with small ones. The arrows placed on the photograph are not there to call attention to the larger

growth but to mark the years of maximum sunspots. The other twelve trees of that group do not show quite so perfect rhythm as this particular part of this section but are like the other parts of this section, showing strongly a majority of the maxima. Taking the group as a whole the agreement is highly conspicuous and the maximum growth comes within six-tenths of a year of the sunspot maximum.

In order to test further this coincidence, groups of tree sections were obtained from other parts of Northern Europe, namely, Southern England, outer coast of Norway, scattered places along the inner coast of Norway, Christiania, Central Sweden, scattered localities in Sweden, Northwest Austria and Southern Bavaria.

Five of these eight groups are of the Eberswalde type and show the sunspot variation. Of the other three, the trees from the inner coast of Norway as a whole appear to show a reversed cycle, probably because they are deep inland valleys while the southern groups, Northwest Austria and Southern Bavaria, close to the Alps, have combined agreement and disagreement so that they cannot as yet be considered to give a definite result. In the six groups, however, representing the triangle between England, Northern Germany and the lower Skandinavian Peninsula, a variation in growth since 1820 showing pronounced agreement with the sunspot curve is unmistakable. Every sunspot maximum and minimum since that date appears in the trees with an average difference in growth of twenty per cent between them. This is shown in the diagram ac-



TREE SECTION, *PINUS SYLVESTRIS*, FROM NORTH GERMANY  
Figure 3—The arrows mark the years of greatest sunspots. Note the periodic character of growth.

companying this article. The next most pronounced feature is that five of the eight minima show a small and brief increase in tree growth. This suggestion of a second maximum is of interest because in it we find agreement with Hann and Hellmann in their studies of European rainfall and sunspots and lend added weight to results which each author obtained but which neither allowed himself to regard as conclusive. In the splendid work of Hellmann upon the rainfall of the North German drainage area, it is this inconspicuous maximum which he finds the more important of the two.

In summarizing, two facts and a conclusion stand out prominently. First, it has been shown that trees may,

\*See chapter by the writer in "The Climatic Factor," Carnegie Publications, 192.

and some in dry climates do, give a valuable record of annual rainfall; second, it has been shown that trees may, and some in wet climates do, give an excellent record of sunspot activity. Now, unless we introduce some new agency such as a profound changing stimulation in the direct solar rays, a subject well worth investigating, we must regard the trees as receiving their solar influence through the medium of the weather, and are forced to the conclusion that there is a connection of some sort between solar activity as displayed in sunspots and the weather, which by the aid of tree growth we have a most extensive means of investigating. Here then we are presented with a most fascinating field for future work. We must admit from the photograph and curves that there is a physical connection between solar activity and the growth of vegetation, certainly as represented in trees of certain districts. But the nature of this connection, through what weather element or elements it takes place, just how the sun affects those elements, even the exact causes of sunspots and why they recur in larger numbers every eleven years, are questions which will only be cleared up by extensive investigations.

One final practical word is well worth saying to lovers of forests. The account here given presents an idea of the value of records contained in trees. It is the oldest trees containing the longest records which are likely to die or be cut down first. So it is within the power of those having the care of forests, when the very old trees have to be removed, to preserve sections, marking them carefully with the month and year and locality, and thus preserve for future investigators, sources of information which, once lost, can never be replaced.

### WHITE PINE BLISTER DISEASE

**A**T a recent meeting in Pittsburgh of the Committee on the Suppression of the Pine Blister Rust in North America about 30 representatives from the Department of Agriculture and various states and Canadian provinces were present. It was brought out that the blister rust is probably worse in Northern than in Southern Europe, and that it may, therefore, prove particularly destructive in the Northern United States and Canada. Dr. Spaulding, of the Office of Forest Pathology, stated that he believes the blister rust is more virulent on healthy, growing trees than on weaker ones. Wind is probably the main agent in distributing the disease, but birds and insects are also responsible. The disease is so firmly established in New England and New York, and probably in Ontario, as to make its eradication impossible. It is more widely distributed in the Lake States than it was a year ago, particularly in the St. Croix River Valley. So far as known, it has not been introduced in the western white or sugar pine regions.

**N**OT everyone knows that the first Pennsylvanian to really appreciate the value of forests was William Penn himself. In 1631 he provided that for every five acres cleared in Pennsylvania one acre should be left in woods.

### DONATIONS TO THE LUMBER AND FOREST REGIMENTS RELIEF COMMITTEE

**A**ERICAN FORESTRY will publish each month the list of those making donations to this fund since the fifth of the preceding month. Practically all of the donations so far received have been made without solicitation and were inspired by reading in the magazine that a relief and comfort fund for the men of the forest regiments was to be started.

Contributions to and including December 5, 1917, are as follows:

W. R. Brown, Berlin, N. H.	\$500 00
The Southern Lumberman, St. Louis, Mo.	25 00
L. H. Daloz, Boston, Mass.	12 00
L. F. Beigham, Chestnut Hill, Mass.	12 00
Wash. Heights Century Club, Wilmington, Del.	10 50
Cleveland Oconee Lumber Co., Atlanta, Ga.	10 00
John C. Freund, New York City	10 00
I. T. Beckwith, New York City	10 00
W. H. McElwee, Raleigh, N. C.	10 00
W. B. Mershon, Scio, Mich.	1 00
Clarence Hay, New York City	7 00
Mrs. T. M. Ives, New York City	7 00
C. I. McNair, Cloquet, Minn.	7 00
F. R. Thorns, New York City	7 00
Frederick R. Simms, Chislehurst, England	6 50
F. A. Chace, Fall River, Mass.	5 00
Dover, Del., Century Club	5 00
Newark, Del., New Century Club	5 00
Acorn Club, Seaford, Del.	5 00
Mrs. Wm. R. Cabot, Boston, Mass.	4 00
Miss Harriet Fearing, Baltimore, Md.	4 00
Miss Anna G. Bard, Huenema, Cal.	2 00
Mrs. James H. Beal, Boston, Mass.	2 00
Miss Bertha G. Brooks, New York City	2 00
Miss G. S. Cary, Boston, Mass.	2 00
Miss C. G. Curris, Intervale, N. H.	2 00
Mrs. Geo. H. Hosmer, Ithaca, N. Y.	2 00
Miss Lucy Lewis Hay, Philadelphia	1 00
Mr. and Mrs. J. H. Lesh, Newton Center, Mass.	1 00
Wm. S. Perot, Conshohocken, Pa.	1 00
Total	\$687 00

### THE FOREST FIRE SEASON

**T**AKEN as a whole, the forest fire season of 1917 has been the most serious throughout the West since 1910. Not since that year has the Forest Service been put to so severe a test. California escaped with less damage than the Northwest, where 7,688 fires were reported, entailing an expenditure of \$1,825,000 for fire protection. In August the Governor of Oregon placed detachments of troops throughout the state where incendiary fires were prevalent, and closed the hunting season after it had been open for a week. In the State of Washington the forest fire wardens controlled bad fires at the expense of those responsible for their origin, a measure which was said to prove very effective.

**T**HE California Packing Corporation of San Francisco was awarded the sale of 233,000,000 feet of timber on the Norval Flat-McCoy chance on the Lassen National Forest. Three bids were received, that of the successful competitor being 10 cents per thousand above the minimum. The prices to be paid are: For yellow, Jeffrey, and sugar pine, on the Norval Flat, \$2.85; on the McCoy chance, \$3.00; for fir on both, 50 cents per thousand.

# THE WOODPECKERS

(Family Picidae)

BY A. A. ALLEN, PH.D.

ASSISTANT PROFESSOR OF ORNITHOLOGY, CORNELL UNIVERSITY

**F**EW birds are more easily recognized by the layman or the amateur ornithologist than are the woodpeckers. In spite of the fact that they constitute a large family of over 375 species and are found over the entire world, except in Madagascar and the Australian region, they are remarkably uniform in their habits and in their modifications. Indeed, some of the distinct and even strikingly marked species, like our downy and hairy woodpeckers, resemble each other almost feather for feather. Twenty-four of the nearly 200 species of woodpeckers occurring in the New World are found in North America.

The typical woodpeckers have large heads with stout chisel-like bills which end in a narrow edge rather than a point, and are thus well suited for chipping wood. Their tongues are very long, capable of being protruded a couple of inches beyond the tip of the bill, and have recurved barbs at the tip. This combination of bill and tongue make a perfect tool for drilling into the chambers of wood-boring larvae and spearing the concealed grub. For this reason woodpeckers are considered one of the most valuable groups of birds.

The tail feathers of the woodpeckers are very stiff and pointed and serve as props to support the weight of the birds as they climb the trunks of the trees in their characteristic manner. The tiny woodpeckers of South America and Africa, called piculets, and the four species of wrynecks of the Old World, however, have soft tails.

The feet of woodpeckers, likewise, are adapted to this climbing habit and differ from all of the birds that we have thus far considered, in having two toes directed forward and two backward. Thus they serve as pincers for better grasping the bark. In a few species, the three-toed woodpeckers of northern North America, one hind toe has been lost.

Because of all these modifications, the woodpeckers are separated from the Order Passeres or "Perching Birds" to which the families heretofore considered be-

long, and are put in an order by themselves, the Pici.

In color, the woodpeckers vary from the common black and white varieties, through various shades of brown and green, to those that are brilliant scarlet and yellow. In fact, patches of scarlet are found on the heads of the males of most species, even the most dully colored.

Woodpeckers are usually solitary birds and even the family parties disperse soon after the young are able to care for themselves. Our northern species, however, sometimes gather in scattered groups during the winter, often accompanying the flocks of chickadees and nuthatches, and regularly come to feeding stations main-

tained for them. In fact, they become so fond of suet that they continue to visit pieces hung in the trees all through the summer months, even when they drip in the sun and become rancid. They even feed their young with some suet and bring them to it when they are able to fly.

In nesting habits also, woodpeckers are remarkably uniform, for they all drill holes in dead or soft-wooded trees and lay their eggs on the chips at the bottom of the cavity. The size of the hole varies from about one and a half inches in diameter with the downy to two and a half inches with the flicker, and is correspondingly larger with the pileated and ivory-billed species. The hole is directed toward the center of the tree but a short dis-

tance and then drops downward for from six to eight inches to two feet and is usually enlarged toward the bottom for the convenience of the incubating bird. Usually both birds assist in drilling the hole and often carry the chips to some distance from the tree in order not to attract attention to it. The eggs are always glossy white and unspotted, but the number varies with the different species from four to twelve. There is one celebrated case of a flicker which continued to lay as often as the eggs were removed, until it had laid 71 eggs in 73 days.

Most woodpeckers excavate new nesting cavities each year, but some return to the same hole year after year.



A RED HEADED WOODPECKER RETURNING TO HIS APARTMENT

When he returned from the South a flicker had usurped his previous years' hole and he was compelled to drill another higher up. The two families had frequent quarrels.



particularly the flickers and red-headed woodpeckers. Some make roosting holes for the winter or for the male bird while the female is incubating. In Europe several species of woodpeckers have come to use artificial nesting boxes put up for them, but, in this country, the flicker is, as yet, the only one that does so regularly. Other species will undoubtedly learn to do so as time goes on and available dead trees become scarcer and nesting boxes more plentiful.

To be acceptable to a flicker, a nesting box should be from six to eight inches square inside, and from 18 inches to two feet deep. The hole should measure two and a half to three inches in diameter and should be on one side, a couple of inches from the top. The inside of the box should be rough. The best place for the box is 15 or more feet from the ground, on the straight bole of a tree free from branches, on a dead tree, or on the top of a tree that has been cut off. Inasmuch as woodpeckers build no nests at the bottom of their holes, but merely lay their eggs on the chips at the bottom, it is necessary



"BIRDS OF A FEATHER FLOCK TOGETHER"

A downy and hairy woodpecker at a feeding station. When they are seen together the difference in size is very apparent but otherwise the two species are easily confused.

although for some reason it is rather rare in some localities, particularly in New England. Males and females are alike with the entire head a deep red, the back and most of the wings blue black and the secondaries of the wings, the lower back and underparts pure white, giving them a most conspicuous appearance, especially in flight. The males of many species of woodpeckers have more



THE HOMING BIRD

A flicker coming home to the nest that it has occupied for three successive years. The scaffolding and the box at the right show how the next photograph was secured, the camera being put in place of the box and the shutter worked with a string.

to put about two inches of sawdust or ground cork in the bottom of the box to keep the eggs from rolling around.

Woodpeckers have no true song and their call notes are inclined to be harsh and unmusical. In place of a song, the males, and possibly the females at times, have a loud rolling tattoo which they make by hammering with the bill upon a dead limb, a loose piece of bark, a drain pipe, tin roof or other resonant surface.

The most striking member of the woodpecker family in North America is the red-headed species, found from Ontario to the Gulf and from Colorado to the Atlantic,



THE FLICKER AT ITS NEST

Note the feet with two toes forward and two backward, characteristic of the family. The flicker's bill is slightly curved and more pointed than other members and his habits are different.



Photograph by C. W. Leister

**A RED-HEADED WOODPECKER RETURNING TO ITS NEST**

The hole has been cut so neatly through the bark that it is difficult to see it in the photograph.

or less red on the head, but no other has the entire head red.

Redheads are versatile birds in their feeding habits, and though they drill for their food less than the downy and hairy species, they often fly out after passing insects like the flycatchers or get down on the ground in search of ants and worms like the thrushes. Occasionally individuals arouse the enmity of the whole bird and human world by taking on nest robbing habits, eating the eggs or young of smaller birds. In the fall of the year their



**A DOWNY WOODPECKER AFTER SUET**

The suet has been rammed into a hole bored for it so that crows and squirrels cannot carry it away in one piece.

presence in a locality is largely dependent upon the supply of beechnuts, chestnuts or acorns, and at these times great disputes often occur between the redheads and the blue jays for the possession of certain nut trees and for a time such trees present a riot of color. Like the nuthatches, redheads often store nuts for winter use in the crevices of the bark or in fence posts. If the nut crop is good redheads are likely to pass the winter as far north as northern New York or Ontario, but otherwise they retire south of Maryland.

More abundant in most places than the redhead is the flicker, the only brown woodpecker in the United States. The flicker is known by various local names, such as high-hole or high-holder, clape, wickup, wake-robin, golden-winged woodpecker, and over 100 others which space forbids to mention. The flicker is about the size



**PROVING HIS TRUST IN MAN**

A hairy woodpecker taking suet from the window casing. The photograph was taken through the window.

of the redhead, somewhat larger than a robin, brown above barred with black, light brown below spotted with black, and grayer on the head. Its most characteristic marks are a red crescent on the back of the head, a black crescent on the breast, a white patch on the rump, and golden yellow lining to the wings and tail. The western flicker has this lining of the wings and tail red instead of yellow.

The flicker is a rather aberrant member of the family and now seldom drills for boring larvae. Its favorite food is ants, which it secures by drilling into their nests upon the ground. Thus it is frequently seen hopping about lawns with the robins. Its bill is slightly curved

and less chisel-like than most woodpeckers', and its tongue, instead of being barbed, has a sticky secretion poured upon it from the modified salivary glands which entangles the ants.

The downy and hairy woodpeckers are found throughout North America east of the Rockies, and are perhaps the best known of all the woodpeckers. The northern and southern birds have been separated into distinct races because of slight differences in size, but, to all appearances, the birds are the same. The two species are almost exactly alike, except for size, the hairy woodpecker being about the size of a robin (9.4 inches in length), and the downy somewhat larger than a sparrow (6.8 inches). Both birds are striped black and white above, and pure white below, about the only difference being that the outer tail feathers of the hairy are pure white, while in the downy, they are barred with black. The males of each species have a crescent of bright scarlet on back of the head, that of the hairy being divided through the middle by black. Both species are permanent residents where found, and often nest in the vicinity of the place where they are fed in winter.

Another familiar species of the southern states, ranging as far north as southern New York, is the red-bellied woodpecker. It is a noisy bird about the size of the hairy, but with the whole top of the head red and with the back barred rather than striped. The red of the



WOODPECKERS ARE VALUABLE BIRDS

A downy woodpecker and indisputable evidence of his routing of bark beetles from his territory.

belly is quite inconspicuous. Like other woodpeckers, it is fond of suet.

The largest of all the woodpeckers is the ivory-billed species, a bird about the size of a crow, and fully as black, with a scarlet crest, a white stripe on each side of the neck, and large white patches in the wings. It was formerly not an uncommon bird in the larger forests of

the South Atlantic and Gulf States but now is confined to the largest and most remote cypress swamps of the lower Mississippi Valley and Gulf States, where it is on the verge of extinction. It is a wild, shy bird, and cannot withstand the encroachments of civilization and the lumber mill.



"WELCOME HOME"

The downy returns with a full market basket of supplies for his always hungry young family.

Nearly as large and much more widespread, though confined to the forests, is the pileated woodpecker. It is similar in color to the ivory-billed, but has somewhat lighter underparts and does not have the white in the wings so conspicuous or the ivory-white bill. The northern and the southern forms of this bird range from Quebec to the Gulf, but it is nowhere a common bird. In the cypress swamps of Georgia and Florida, however, it occurs in numbers.

The red cockaded woodpecker is one of the less well known woodpeckers of the South, found in the pine forests. It is similar to a hairy woodpecker in general appearance, but has the back barred with black and white and has black streaks on its sides.

The three-toed woodpeckers, of which there are two species inhabiting the boreal regions and coming southward in winter to northern United States, are also about the size of the hairy, but have an orange yellow patch on top of the head.

In the West are found the California Woodpecker, which has the habit of storing acorns in holes which it drills in the bark of trees, the gila and golden-fronted woodpeckers, which resemble the red-bellied species; the Lewis woodpecker, the greenest of the North American species; the red-naped, red-breasted and Williamson sapsuckers which are similar in habits to the eastern yellow-bellied sapsucker.

The sapsuckers get the name from their habit of drill-



ing rows of small round holes in the bark of many species of trees and drinking the sap which collects. One bird usually taps several different trees and each one in several places, and then makes the rounds as often as the sap collects. It is interesting to note that the barbs on the tongue, so characteristic of the woodpeckers, have



Photograph by G. A. Bailey.

#### HE ALSO LIKES SUET

A red-bellied woodpecker at a feeding station. This is a southern species, but ranges as far north as southern New York.

been modified into a fringe or brush for collecting the sap. Sapsuckers eat likewise such insects as are attracted by the sap and, like the red-headed woodpeckers, are quite expert at catching insects on the wing. In addition they eat some of the soft inner bark exposed when the holes are being drilled, and, in soft-wooded trees, like the poplar, where the sap does not flow freely, and the cambium is almost gelatinous, they sometimes peck off fairly large areas. Ordinarily their rows of holes do not overlap and little or no damage is done to the tree, but sometimes, when the birds are very numerous, and for some reason persist in attacking a particular ornamental evergreen or mountain ash, they ruin its appearance, seriously weaken it, or even kill it. The holes drilled by the sapsucker often stain the underlying timber, causing what

are known as "bird pecks," and are said by lumber dealers to cause a devaluation to timber of the United States of nearly a million dollars annually.

At times sapsuckers behave in an erratic and foolish manner, zigzagging through the trees with no apparent reason, flying into windows or walls or the sides of houses, even becoming so stupid as to allow themselves to be picked from the trees, or alighting on one's person and climbing up his leg as though it were the limb of a tree. It has been suggested that the sap ferments in the sun and that the sapsuckers become intoxicated, but this theory has by no means been proved.

The common sapsucker of the East is the yellow-bellied species. It is about the size of a hairy woodpecker with the same general appearance, but has the throat and the whole top of the head red. It has also a conspicuous



#### YELLOW-BELLIED SAPSUCKER

The Sapsucker at his sugar bush. The numerous round holes drilled to get the sap do not usually injure the trees, but sometimes do, and stain the underlying timber.

white stripe on each wing, a black crescent on the breast, and slightly yellowish under parts which are somewhat streaked. The female has a white throat and of immature birds the top of the head is black.

**T**HE use of creosoted wood blocks, which originally began as paving material for city streets, has now spread into many other lines, according to a statement issued by the United States Forest Service. The durability of such pavement, the noiselessness under heavy traffic, and its sanitary properties give creosoted wood block especial value for use where heavy trucking takes place, and such flooring is now found throughout the country in factories, warehouses, machine shops, foundries, quarries and docks, and even in hotel kitchens, hospitals, laundries and slaughter houses.

**I**N the study of wood using industries foresters from Syracuse University have discovered an Onondaga County man who has an interesting water-power saw mill. When the power is not needed for the saw mill he runs either a grist mill, or a cider mill with it. He also has a small electric light plant operated by the same power. The mill has been in operation for more than twenty-five years. Authorities at the College of Forestry say that full and profitable utilization of the woodlot products will be assured only when the State is dotted with these "many purpose" mills.

## WOOD TO THE FRONT AS WARTIME FUEL

WITH every section of the country clamoring for coal and with the railroads experiencing the worst traffic congestion in the history of the United States, recourse is had to the forests as affording a solution of the wartime fuel crisis. From those in authority has come the call for the use of wood as winter fuel in the household and wherever else its use is possible. Briefly and baldly stated, there is not enough coal to go around, and unless wood is used in its stead the coal famine will prove disastrous.

Reduced to figures the coal shortage amounts to fifty million tons. This means two and one-half tons for each of the twenty million families in the United States. To transport this amount of coal would require the use of a million coal cars of fifty tons capacity apiece. In saving this strain on already overtaxed transportation lines and in conserving the fuel supply of the nation it is argued that the individual household can show a measure of patriotism which is vital to the national strength.

Nor does the demand for fuel conservation limit itself to the household. The United States Government has pointed out that churches can make important contribution by using wood in their furnaces. The experts maintain that wood is even better than coal for heating churches lodge rooms and other places where heat is not constantly required. When heat is wanted in places of occasional assemblage it is required quickly and in large volume. For such purpose no other fuel answers as well as wood. The saving to be effected by use of wood would in these instances work no hardships and the aggregate would be of tremendous importance in making the available supply of coal meet imperative needs.

Definite plans for the substitution of wood for coal have been worked out by the United States Fuel Administration and state organizations all over the country. New England was one of the first sections to take active heed of the situation. Early in December New England

was several million tons short of its requirements for soft coal. Hard coal had been in fairly plentiful supply during September and October, but with the increased needs of winter there was not enough to meet the demand. Every effort was made by the fuel administration to facilitate shipments and to secure the economical use of the coal received, but even after curtailing or eliminating unnecessary forms of use the situation was steadily becoming more serious. The outlook for improvement in future deliveries was unfavorable and the fuel administrator took steps to warn the public of the situation and to urge that personal and community prudence, as well

as national patriotism, required that New England begin at once to utilize her native supply of cordwood to the fullest possible extent.

It has been ascertained that the supply of wood now on hand throughout the New England states is considerably less even than normal requirements. With increased stringency in the coal situation practically certain and with the possibility that another winter will find the condition even worse, earnest efforts are being made to stimulate wood cutting and wood using without delay. To this end local committees of public safety in all wood producing localities and county agents throughout the various states have been requested to take inventory of all available supplies of cordwood stumpage within reasonable dis-

tance of a market and to endeavor to arrange for its immediate conversion into fuel.

As the text of this campaign a poster issued by James J. Storrow, federal fuel administrator for Massachusetts, and published herewith, makes the statement that New England must burn more wood; that the coal shortage is serious and that this condition is likely to continue during the war.

The New England movement is typical of the intensive campaigns inaugurated throughout the country under the guidance of the United States Fuel Administration,

# CUT-A-CORD



NEW ENGLAND must BURN more WOOD.  
THE COAL SHORTAGE IS SERIOUS.  
A condition likely to continue during the war.



## STOVE AND FURNACE WOOD EVERYWHERE IN DEMAND

War Ships and Munition Plants Cannot Burn Wood  
We Ought Not to Demand the Coal They Need  
New England Volunteers Her Woodlands in the Emergency

If You Own a Wood Lot

**Cut Some Wood in the Service of Your Country**

If you need fuel, BUY WOOD FROM YOUR FARM NEIGHBORS. Order now what you will need later. Let the choppers know who will take their wood. There is another winter coming after this.

Comparative Fuel Values of Green and Dry Wood		Relative Fuel Value of a Cord of Dry Wood in Tons of Hard Coal	
Wood seasoned 12 months, fuel value	100 per cent.	One Cord Equal to 1 Ton	One Cord Equal to 1.2 Tons
" 9 " " "	95 " "	HICKORY	BASSWOOD
" 6 " " "	90 " "	OAK	SOFT MAPLE
" 3 " " "	85 " "	RED MAPLE	CHESTNUT
" 0 " " "	80 " "	BEECH	GRAY BIRCH
		ASH	POPLAR
		APPLE	

Coal burning stoves and furnaces may be adapted for burning wood by placing strips of sheet iron over the grates or by use of fire brick.

OFFICE OF

**JAMES J. STORROW,**

Federal Fuel Administrator for Massachusetts, State House, Boston

in co-operation with the Department of Agriculture. The Southern states have vast supplies of wood and activities are already under way in that section looking toward the substitution of wood for coal. The Department of Agriculture has volunteered to provide the services of expert foresters who will supervise the cutting of wood so that no damage may be done to growing timber and in order that the largest use may be obtained of the supply of wood. In addition to this source of supply the government has statistics to show that there is a large quantity of dead wood in many sections of the country and that the supply in many communities is large enough for the entire needs for domestic purposes. In many instances this wood is destroyed as waste.

One cord of hardwood is declared to equal a ton of hard coal in fuel value. This takes in such woods as hickory, oak, hard maple, beech, ash, birch and apple. Varieties of wood which equal three-quarters of a ton of coal to the cord are basswood, soft maple, chestnut, gray birch and poplar. A value of half a ton to the cord is

imputed to pine, aspen, hemlock, cedar, spruce and balsam.

The government is making every effort to prevent the creation in this country of fuel conditions such as those with which Europe is confronted. In a single day early in December Associated Press dispatches from London, Paris and Rome detailed the serious fuel problems in England, France and Italy. England has been forced to establish fuel rations based on a weekly allowance of 200 pounds for a four-room house. France has issued coal cards, with a limit of 264 pounds a month for families of four persons or less. In Italy heating has been suppressed except in public buildings and cooking is done with gas or charcoal. The coal supply of Italy is so short that during last summer more than 1,000 square miles of forests were cut down for use as fuel and for making charcoal.

Students of the situation in the United States agree that the use of wood is the sole solution of a fuel crisis which is constantly growing more acute.

## BLACK LOCUST NEEDED FOR SHIPS

THE revival of the wooden-ship industry has occasioned a considerable demand for black locust wood for "treenails," which are used to fasten the planking to the ribs of the ship. Black locust originally occurred only along the Appalachian Mountains and on the adjacent highlands, from Pennsylvania to Georgia, but it has spread until it now is found in merchantable sizes over a large area. The wood is very hard and close grained and is one of the most durable hard woods known, particularly when in contact with the soil or in other moist situations.

In supplying black-locust wood for shipbuilding purposes it is very important, experts of the Forest Service say, to be able to distinguish it from that of the honey locust, a tree quite similar in many respects but whose wood has a coarser grain and is of inferior quality. The danger of selecting the wrong tree is increased by the fact that in some localities the names applied are exactly reversed, the honey locust being known exclusively as black locust and the true black locust being known as honey locust.

In the case of both trees the leaves are of the compound type, that is they are composed of a number of small leaflets arranged along the central leaf-stalk. The true black locust (which is known botanically as *Robinia*

*pseudacacia*) has leaflets with smooth or entire margins. The leaves of the honey locust (*Gleditsia trianthus*), however, are shallow-toothed or scalloped along the edges, particularly toward the ends.

The character of the thorns also furnishes a dependable means of identification. The thorns of the black locust are short and arranged in pairs. Those of the honey locust, on the other hand, are frequently several inches in length, are often divided into three or more branches, and may be produced in great quantities. They often occur in dense clusters along the main trunk of the tree. The seed pods are also distinctive. Those of the honey locust are, as a rule, from 10 to 18 inches long, while the pods of the black locust are shorter and usually measure from 2 to 4 inches.

To the experienced woodsman all of these features, of course, are very familiar, as is also the characteristic appearance of the black locust caused by the attacks of an insect known as the locust borer, which causes a characteristic swelling of the branches.

The officials of the Forest Service at Washington will identify specimens without charge. They point out that samples of leaves, twigs and fruits are always more dependable as a means of identification than the wood itself.

WHILE the studies of the value of the grazing privilege made this year have borne out the original position of the United States Forest Service that the fees formerly in force should be doubled, the present difficulties of the western livestock industry and the necessity for stimulating livestock production as a war measure have caused the Secretary of Agriculture to defer for the present any further increase in grazing fees, except

minor changes to correlate the fees between certain forests or groups of forests.

UNDER a contract with a film manufacturing company, the Department of Agriculture will supply motion pictures dealing with its activities, every two weeks. The first release was "The Work of a Forest Ranger."



# PLANTS AND ANIMALS OF THE ATLANTIC AND GULF STATES

BY DR. R. W. SHUFELDT, C.M.Z.S.

**F**ROM the Atlantic to the Pacific, all through the northern and middle tiers of states, there is very little flower collecting to be done during the month of December, while it is just the reverse in the case of those regions of the country bordering upon the Gulf of Mexico and the South Atlantic Ocean. In the latter area many plants, and some trees, are in full bloom; a long list of flowers are there to be studied, and, incidentally, not a few very interesting animals. When the country is covered with snow in the North, and the temperature rarely rises above the fifties, we never, as a matter of course, meet with any flowers, while occasionally we do run across various kinds of seed-pods, and sometimes remnants of plants, all of which are worthy of close observation and study.

As the holiday season comes on—war or no war—and the Christmas idea comes into the minds of the people, there is no plant or tree that appeals to us more forcibly than does the well-known American holly. A beautiful example of this is presented in Figure 1. Throughout the region where this tree or shrub grows—more particularly in the neighborhood of our cities—it seems to stand much in need of Federal protection, for the reason that the gatherers of its berried branches, in order to meet the demand of the market for it during the holiday season, have ruined and mutilated thousands of its kind. It

is a pitiful sight to observe the miserable, semi-limbless stumps of the holly in the fields, along the roadsides, and at the edges of some of our forests. This vandalism is carried on each year for miles about any one of our large northern cities.

Neltje Blanchan, who has searched out some of the ancient superstitions in regard to holly, very truly points out for us that "happily we continue to borrow all the beautiful Old World associations, poetical and legendary, that cluster about the holly at Christmas time, although our native tree furnishes most of our holiday decorations. As far back as Pliny's day, the European holly had all manner of supernatural qualities attributed to it; its insignificant little flowers caused water to freeze, he tells us; because it was believed to repel lightning, the Romans planted it near their houses; and a branch of it thrown after any refractory animal, even if it did not hit him, would subdue him instantly, and cause him to lie down meekly beside the stick! Can it be that the Italian peasants, who still believe cattle kneel in their stalls at midnight on the anniversary of Jesus' birth, decorate the mangers on Christmas Eve with holly, among other plants, because of a survival of this old pagan notion about its subduing effect on animals?"

The leaves of the American holly remain on the tree for three years; and we use the wood, which very closely



A RELIC OF THE PAST

Fig. 11.—In the National Zoological Park, at Washington, we find many trees and animals well worthy of our closest study; later on, some of these will be referred to in greater detail. The rustic bridge here shown spanned one of the streams in that beautiful preserve. About a year ago it was replaced by a substantial stone one, so this picture is both historical and unique.

resembles ivory, for inlay work, tool handles, whip stocks and walking sticks. Engravers prize it very highly to engrave upon—an art now almost out of date; and it also has many other uses. This tree, that is, the American holly, will, within the next half century, be utterly extinct in the United States. Other hollies are the Yaupon, the Dahoon, the Swamp or Meadow holly, and the Mountain holly. In the Old World there are still different species of *Ilex*, and nearly all of them are fine and ornamental trees, worthy of far better protection than they now receive.

Far back into history the holly and the mistletoe are closely associated, in a decorative way, all through the holiday season, and many of the customs have come down to us.

"The mistletoe hung  
in the castle hall,  
And the holly  
branch hung on  
the old oak wall;  
The baron's retain-  
ers were blythe  
and gay  
Keeping their  
Christmas holi-  
day."

Holly trees transplant very successfully if proper precautions are taken, and a very beautiful species, with immense, red berries, is being introduced here from Japan. All the various kinds now to be found in the country should, at the suggestion of the American Forestry Association, be protected by both State and Federal Governments before it is too late to save them.

More than abundant all through the autumn, and often up to the arrival of winter, is the well-known little White Heath Aster (Figure 2), which looks for all the world like an extremely small edition of our common daisy of the meadows. It has also received the name of Michaelmas Daisy, White Rosemary, Farewell Summer, and Frostweed—because Jack Frost sometimes sees it in bloom. It rarely grows more than a yard high, and is sometimes so massed in favorable places that it appears, at a little distance, like some kind of a feathery inflorescence. Occasionally its little flowers are more or less strongly tinged with magenta or pale purple. The central discs are bright yellow, while the leaves of the plant are light green, minute, linear and heathlike, to become.

near the base of the smooth stem, more lance-shaped and blunt; these latter may be minutely toothed or serrate.

In some parts of the country the bee-keepers have encouraged the spread of this tiny aster, for not only is it known to yield a large amount of nectar, but the latter is of a brand that our honey-bees are extremely fond of.

This miniature edition of the daisy may readily be identified by its very small and very rigid leaves. Last summer (1917) many of the early autumn flowers—this little Michaelmas daisy or aster among them—were ushered in with a flourish of trumpets, as it were, if one may be permitted to thus refer to the imaginary finale of the trumpet-flowers, as they drop out of the list of flowers that bloom in the northwestern sections of the country as September draws to a close.

Flowers of the Trumpet-creeper are among the most conspicuous of all those that are to be seen in the districts where the plant thrives, which includes, as a rule, the time extending from April to September, depending upon

the latitude where it is found. Those who have had the pleasure of seeing these great orange and scarlet flowers growing wild are not likely to ever forget the sight. Sometimes the vine may be massed over the great stone pier of a bridge at its initial anchorage, when hundreds of the flowers are in view at once. They stand out with especial prominence in the setting they receive from the luxuriant foliage of this great climber, its toothed and



AMERICAN HOLLY, A TREE RAPIDLY DIS-  
APPEARING IN SUBURBAN DISTRICTS

Fig. 1.—It is said that the generic name, *Ilex*, of this splendid tree is the ancient Latin name, originally applied to the Holy Oak; *opace* is its specific name. Its drupes are of a brilliant red or vermillion color, while in some of the other hollies they are yellow.



HERE WE HAVE ONE OF THE LITTLE  
RAGAMUFFINS OF THE ROADSIDE

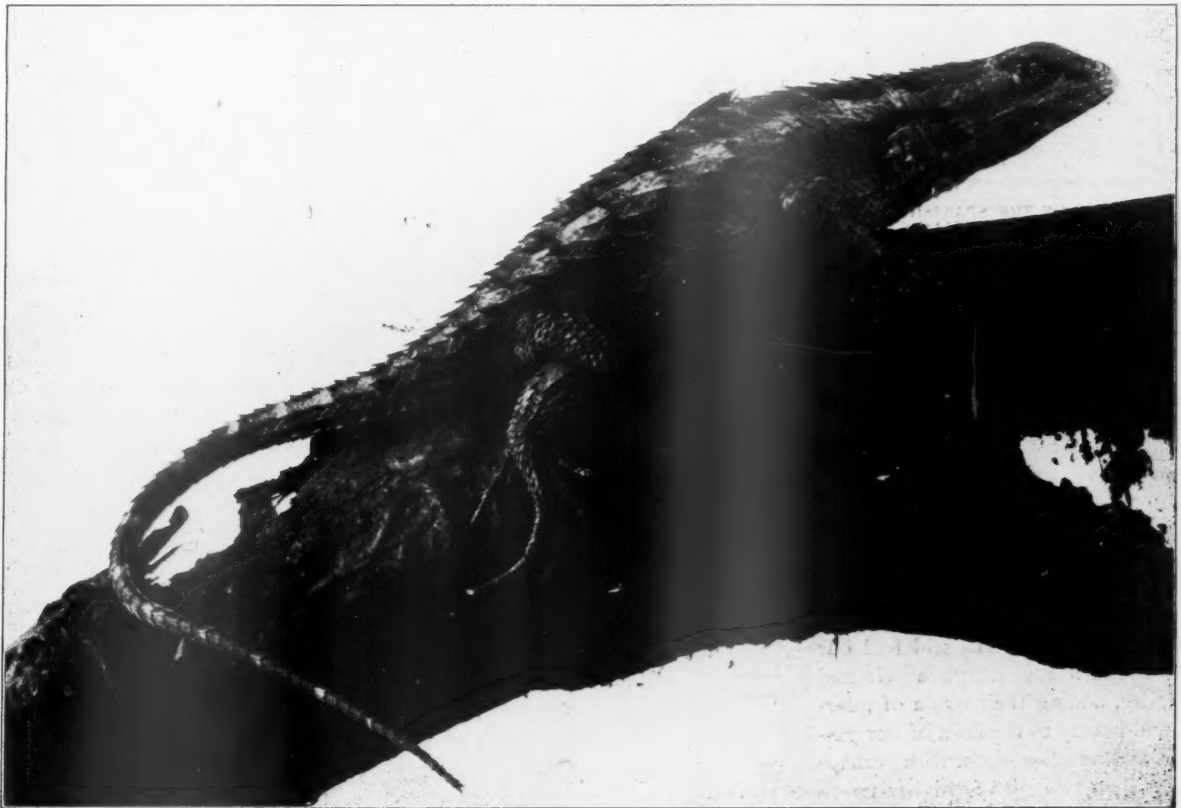
Fig. 2.—This tiny white aster is pretty generally known as the Michaelmas Daisy or Heath Aster (*Aster ericoides*). In the middle districts of its range, it sometimes blooms as late as November; it is a very abundant species as far south as Kentucky.

pointed leaflets being of a paler shade than the dark, shiny green, matured leaves, which are pinnate in outline and ovate in form. As will be noted in Figure 3, the flowers are corymbed, the brilliant corolla being funnel-formed, five-lobed, and somewhat irregular. The vine itself is woody, and climbs by means of its aerial rootlets. Its pods are well illustrated in Figure 4, where, too, may be seen some of the flattened, winged seeds. This flower is a great favorite with our Ruby-throated Humming-bird, and Audubon attempted to portray that spe-

cies hovering over a cluster of them. But the flowers bear but a very faint resemblance to specimens as they occur in nature, or as the camera has depicted them in Figure 3.

Our Trumpet-creeper belongs in the Bignonia family (*Bignoniaceae*), and has been named *Tecoma radicans*, it being the only representative of its genus in this part of the world. Associated with it in the same family we have the Catalpa or Indian Bean (*Catalpa speciosa*), also the sole species of its genus, though Gray tells us that there is "a low much branched tree, with thin bark and a smaller corolla," and so on, which by Thomas Walter has been designated as *Catalpa bignonioides*, and which is

localities, the well-known Virginia Ground Cherry, the highly attractive fruit of which, when ripe, is feasted upon by numerous species of birds of the region where it is found. Among the latter may be mentioned such species as our bluebirds and robins, and they, with others, love the places where this plant thrives best—on our hillsides, in pasture-lands, and on open ground generally. In describing this plant, F. Schuyler Mathews tells us that it is a "branching and erect-stemmed species, mostly smooth. The ovate, lance-shaped leaves, tapering toward both ends, very slightly shallow-toothed and light green. The flower dull pale yellow with five brown-purple spots; anthers deep yellow. The



SPINY SWIFTS, OR LIZARDS, MAKE INTERESTING PETS SOMETIMES

Fig. 7.—In the United States we have a genus of land lizards, to which the name of Swift has been given, for the reason that they can run with such astonishing rapidity. There are some fifteen species of them, and they all fall in the genus *Sceloporus*. They inhabit different ranges in different sections of the country, although several may occur in the same range. The one shown in the cut is one of the largest of the group, and has been called the Spiny Swift (*S. spinosus*) on account of the spiny character of its scales. It occurs in great numbers in Mexico, and from there it ranges northward and eastward from western Texas and New Mexico to western Florida. It has a length, when adult, of nearly ten inches.

here defined as the Southern Cigar Tree or Southern Catawba Tree, to distinguish it from its northern relative. Finally we have in this *Bignonia* genus the Cross-vine (*B. capreolata*), a most interesting climber, which exhibits a "cross" on the surface exposed by a transverse section of its stem. It climbs up into trees, and flourishes in rich soil from Virginia to Florida, westward to include Ohio, Illinois and Louisiana. Most of the *Bignonias* have been cultivated as ornamental trees and vines and may frequently be seen in our gardens or on our estates.

From New York to Manitoba, and southward to the tier of states bounding the Gulf, we may meet, in suitable

stigma matures before the anthers, and extends beyond them. Fertilized by the honey-bee and the bees of the genus *Halictus*; *Halictus pectinatus* is a common visitor (Professor Robertson). The reddish berry enclosed within the enlarged calyx. One to three feet high." There is an insect that feeds upon the leaves of these plants and riddles them with fine perforations, but one of the most interesting things about it is the manner in which the calyx becomes skeletonized, admitting of a view of the fruit inside. When a large cluster of them has passed to this stage, it is certainly a very beautiful object, when held up to the sun in such a way as to observe the lighting up of the whole structure





THE FLOWERS OF THE SPANISH NEEDLES ARE SMALL AND HAVE YELLOW PETALS

Fig. 6—One of the plants in the eastern part of United States which do not shed all their seeds at once, frequently holding them until winter is about over. Many of these seeds stick to one's clothing, when one comes in contact with them in passing through places where they grow and so they are scattered far and wide. The plant is known as Spanish Needle (*Bidens bipinnata*). As a matter of fact, all of the *Bidens* group possess this very annoying clinging characteristic.

as the rays pass through them. These dried plants may sometimes be found in the fields after winter has set in and the ground is covered with an inch or more of snow. They are gentle encouragers as to the fact that the world has not seen its last summer, for when the joyous month of July comes round again in 1918 we shall still find our old friends, the Virginia Ground Cherries, adding their quota of interest and beauty to the flora of our pastures and meadow lands, with perhaps a few scattering plants higher up on the hillsides.

In those parts of the South which we have in mind, many of the smaller animals are in evidence all winter long, while during the same part of the year in the North they hibernate for several months at a time, and are never seen in the woods during the season that Jack Frost holds things in his icy grasp. For example, our beautiful little lizard, the common Swift, disappears just so soon as the really cold weather sets in, and we do not see him again until the bloodroots begin to think of peeping above ground. The male of this species is a beauty, with his glistening azure sides bordered with velvety black, and the bizarre pattern of brown that ornaments his back. From western Texas to Florida, his big cousin of the South (Figure 7), also prettily marked, gets a great deal more out of life than he does; for in the balmy southern regions he loses not an hour through being compelled to hibernate from early winter to the beginning of spring. He may be seen any day in December or January, in the forests of his range, comfortably sunning himself on some old log.

The various species of *Bidens* have practically all shed their seeds in the

North (Figure 6), while in many parts of the country, south of the Mason and Dixon line, the troublesome seeds of these noxious plants are abundantly in evidence. No one of the group is better known, either North or South, than our Spanish Needles—the brown seed needles of which are pretty thick and always double-pointed. These plants belong to the great Composite family (*Compositae*), along with a great many others of our most familiar flowers. In the *Bidens* genus there is even a Tickseed Sunflower, the seeds of which can stick to one's clothing with just as much tenacity as the seeds of the various species of Beggar-ticks in this array of pests of the autumn woods (*B. trichosperma*).

Many people have often wondered what the curious, spindle-shaped, little silken affairs, ornamented with bits of sticks or pine needles are, which are seen hanging from the twigs of many of our city shade trees, as well as from



PODS THAT HOLD THE FLAT, WINGED SEEDS OF THE TRUMPET FLOWER

Fig. 4—Long late in the autumn, the lengthy, deep tan-colored seed pods of the Trumpet flowers are to be seen, dangling from the leafless runners of the vine; from one to several in a bunch, quite a few hang onto the vine until winter is past. The rows of seed are separated by the fibrous division shown in the cut, where two winged seeds are seen falling out.

not a few of the conifers in the forests, especially the red cedar and the arbor vitae. A good picture of one of these is here given in Figure 8, and it is the common "Bag-worm," a tree-pest of the first order. The larva feeds upon the leaves of many trees and shrubs, but ignores the sedges and grasses, and is most injurious. They can best be destroyed by collecting the cases in bags and baskets and burning them in a bonfire. Several years ago a great many bushels of them were thus collected in St. Louis and burned, with decided benefit to the city's shade trees the following summer. The late eminent economic entomologist, Prof. Charles Valentine Riley, gives an excellent account of this, with a life his-



TREE CULTURISTS HAVE GIVEN THE "BAG WORM" VERY CLOSE STUDY

Fig. 8—A remarkable little moth (*Thyridopteryx ephemeraeformis*) ranges from the Great Plains to the Atlantic Ocean, throughout the Appalachian subregion. Its life history is a very strange one, and much has been written upon it. Many shade trees and shrubs are victims of its voracious as well as promiscuous feeding habits; this is its cocoon.

tory of the insect. Dr. William J. Holland, in his "Moth Book," says: "The 'bag' or 'basket' of the male insect is smaller than that of the female. The males escape from the lower end of the case in the winged form, and having copulated with the females, which remain in their cases and are apterous and sluggish, die. The female deposits her eggs, which are soft and yellow, in the sack where she has her home, and ends her existence by leaving what little of her body remains after the ova have been extruded, as a sort of loose plug of dessicated tissue at the lower end of the sack. The eggs remain in the case till the following spring, when they hatch. The young larvae emerge, and placing themselves upon the leaves, where they walk about on their fore feet, with their anal extremities held up perpendicularly, proceed to construct about themselves little cones of vegetable matter mixed with fine silk. After a while they cease to hold these cones correct, and seizing the leaves and branches with their feet, allow the bag to assume a pendant position. They moult within their cases four times before reaching maturity and pupating." Sometimes hundreds of these little bags are seen to be suspended from the twigs of a single tree.

When the frosty nights of October come along, up through the Middle Atlantic and New England States, we have the annual and gorgeous display of the turning of the foliage of many of the different species of trees from the greens of summer and spring to the incomparable tints and shades of the reds, scarlets and yellows that



BADLY "STUNG," WITH THE STINGS PROVING FATAL

Fig. 10—Here we have a more complete example of the Virginia Creeper, with the same specimen of caterpillar shown in Figure 9. The latter has been fatally attacked by a female ichneumon fly, and the masses of white objects almost covering the unhappy victim are the larvae of the parasite. On the evening the caterpillar was collected, it appeared as in Figure 9; while next morning it presented the appearance so well shown here.



THE SCARLET LEAVES OF THE VIRGINIA CREEPER—ONCE SEEN WILL NEVER BE FORGOTTEN

Fig. 9—There is no more beautiful vine in all America than our Woodbine, or, as it is more generally known, Virginia Creeper. It has been called *Pseuderacanthus quinquefolia* of the Vine family (Vitaceae). Its generic name *Pseuderacanthus* is supposed to come from the Greek term *hedera*, given to the ivy. *Quinquefolia* refers to the leaf-arrangement of the five leaflets, so distinctly shown in the cut. The beautiful green caterpillar is the larva of one of our best Sphinx moths, the *Pholus satellitia pandorus*, a subspecies of the Satellite sphinx.

Mexico. Many will be familiar with the sight depicted with the camera in Figure 10 of this article. The unhappy larva has been attacked by one of our smallest thymenopterous parasites—a representative of the ichneumon family. The female of this insect, which is about the size of a mosquito, deposits her eggs upon the skin of the caterpillar. These soon hatch out, and the minute grubs work their way into the body of the victim, to feed upon the fat immediately beneath the skin. Later on, and previous to the maturing of the caterpillar, these grubs appear on the surface of the skin, and there weave the little silken cocoons so well shown in the reproduction of the photograph in Figure 10.

From these cocoons emerge the perfect insects, and the poor caterpillar invariably succumbs to the ordeal through which it has passed. The caterpillars of other species of our beautiful Sphinx moths suffer in a similar manner, and thousands of them perish thus every year.



FLOWERS OF THE GORGEOUS TRUMPET VINE

Fig. 3—There is no vine in America that presents a more striking appearance than our Trumpet-vine (*Tecoma radicans*). Abundant in northern Virginia, it has been introduced as an ornamental vine by many home-owners at the National Capital. In August its gorgeous vermilion flowers constitute one of the glories of the dusty roadside.

usher in the early months of autumn. Amidst this marvelous color-display there is a no more elegant participant than our Virginia Creeper, especially if the vine be a big one and has grown to exhibit its foliage to the best advantage. As these lines are written, the gray, pebble-dashed south wall of my home is overrun with such a vine, covering as it does many square yards. As the sun strikes it during the day, the thousands of scarlet leaves, intermingled with hundreds of bunches of small, round, bluish-black berries—the former all facing outwards—we are having presented to us a sight of peculiar beauty and magnificence—one of the chief glories of America's floral world. Darwin experimented with the tenacious hold of the tendril-disks of this vine, and other writers have had much to say about it. It grows luxuriantly in Cuba and even in northern

# EDITORIAL

## WASTE OF FORAGE THROUGH LACK OF GRAZING

THESE are days when conservation has come to be a grim reality. As never before the American people are striving to save in every way possible. Every natural resource is being made the most of and this is doubly true if it in any way affects our supply of food and clothing.

Much is being said, and very properly, about meatless days, reduction in the use of fats, use of more and heavier woolen clothing to save our coal, conserving our milk supply for the children, and the husbanding of our grains for use as human food.

The American people must produce all of the beef, mutton, wool, milk, cheese, butter and other animal products possible; and yet we must use in doing this the minimum of our valuable grains. This means that we should see to it that every scrap of our cheaper feeds is used in this production. Undoubtedly the cheapest of these feeds is to be found in our western range plants, especially that highly succulent forage, both herbaceous and shrubby, to be found in great abundance in the higher mountainous regions.

This range, in the northern Rocky Mountains, is not fully utilized. It has never been grazed to anything like its full carrying capacity and its waste without doubt constitutes one of our greatest economic leaks in the present crisis.

The forage of our wild lands is produced more cheaply than any other feed of like value. It simply grows without cultivation or care of any kind, and it does not have to be cut, hauled, etc., yet its real value is based, not on the cost of production, but on the amount and value of animal products it will produce when fully utilized by grazing. Never in the history of our country has the demand for animal products of all kinds been so great as at the present time, and yet the demand for grains for human food is so great that they should be used as sparingly as possible for the feeding of animals. It is, therefore, almost a crime to allow grass, if at all accessible, to go to waste when the country is in such dire need of what this forage will produce. The opinion is quite general that the range lands of the West are already fully utilized. This is true for certain portions of the range only. On many of the National Forests in northern Idaho, eastern Washington and western Montana the number of stock grazed is not half what the range can carry. Hundreds of thousands of acres of excellent forage in this region is wasting at the present time which should have been transformed during the past summer into meat and wool. When computed in pounds of food and clothing this loss is enormous and its value at present prices is indeed fabulous. Who is to blame for this state of affairs, and how is this waste to be stopped? No one is directly to blame, and the waste can be stopped only by education and development. The farmers and

stockmen of this region must be educated regarding the nature and value of this range, and the forests must be further developed with roads and stock trails in order that they may be more accessible for trailing herds and flocks in and out of these regions. The forest supervisors are doing this as rapidly as their limited funds will permit, they are also advertising this range and making its value known to stockmen by every means at their command. Yet they cannot get enough permittees to take up the allotments made and only a small part of the stock necessary to consume the forage which annually goes to waste. One of the chief difficulties lies in the fact that the farmers are as a rule inexperienced in trailing stock back into rough and mountainous country. If this range were in Utah, Arizona or California the veteran stockmen in these regions would soon get to it, and it would be fully utilized by these men who would at once recognize its value and eagerly grasp this opportunity for greater sheep and cattle production. Another reason why this range is not taken is because stock owners in the contiguous valleys do not fully understand the great advantage accruing from the formation of co-operative stock associations. In fact, many have never heard of these associations and know nothing at all of how they are operated.

One concrete example will serve to explain conditions obtaining on probably half the National Forests in the northern Rockies, some of which have had practically no grazing animals on them at any time. The forest referred to advertised to allot 12,000 sheep for the summer of 1917, the range being capable of carrying from 25 to 40 per cent more if permittees could be found. However, only 3,000 sheep were brought onto this range for the season. This means that but 25 per cent of the forage necessary to maintain at least 12,000 sheep with their lambs was used during the past grazing season. In other words, the forage necessary to maintain for three months 9,000 sheep with their lambs has been wasted. An investment in sheep of at least \$125,000 could thus have been maintained for one-fourth of the year and likewise its increase of from 5,000 to 6,000 lambs, worth at a conservative estimate from \$30,000 to \$35,000. A fair gain for the sheep for this period would be ten pounds per head and for the lambs thirty-five pounds per head, with two pounds of wool per head for sheep and lambs. This means that forage sufficient to produce 90,000 pounds of mutton and from 175,000 to 210,000 pounds of lamb or approximately 300,000 pounds of meat, and from 28,000 to 30,000 pounds of wool, both much needed at this time, is lost forever. The price at this time is so fabulous that the reader is left to determine the money value for himself. This is one of the smallest National Forests. Many of them in the region named could easily handle five times, and



some ten times this number of sheep, besides many cattle. Those in charge would gladly do this if people could be induced to provide the stock and to use the range. It is believed that many would do so were they fully informed of its real value, the methods of securing the range, and knew how to get the stock back to it. As said before, many have never heard of co-operative stock associations whereby the rancher with only a few head of stock may join with his neighbors, who also have small numbers, and together secure a range allotment for the season. In this way each man holds his stock in his own name, paying his share of the grazing fees and cost of herding. Many people do not realize how

far sheep and cattle may be trailed back into the mountains to excellent advantage. By this method the local ranges would be saved for spring and fall grazing. The opportunity given the close-in pastures for recuperation during the summer months would enable them to support a greater number of stock in the fall and spring, thus enabling the farmer or the stockman of the valleys to considerably increase the number of animals handled, add materially to his income and "do his bit" most substantially by way of augmenting the depleted supplies of our most highly valued classes of food products and clothing material. That this increase should be brought about is highly important.

### WOOD CUTTING TO OVERCOME COAL SHORTAGE

THE serious shortage of coal throughout the entire country makes the substitution of wood for fuel a real necessity. How far increased use of wood can help this year is unknown. It appears, however, that the amount of fuel wood now cut and seasoned is far below normal, not more than one-half the usual supply. The small available supply of seasoned wood has caused the price to increase in many places to nearly double that of a year ago. Some towns in New England are reported as now paying as high as \$18.00 per cord for seasoned wood, while as high as \$12.00 per cord is paid in some places for wood f. o. b. These are unusual prices and were it not for the great scarcity of labor would undoubtedly greatly stimulate wood cutting wherever wood is available. Enormous quantities of standing timber suitable for fuel are available. The situation, therefore, demands prompt action not only to meet present exigencies, but to alleviate the situation a year hence.

The Federal Fuel Administrator for New England, Mr. J. J. Storrow, in a call to a conference on the subject, said:

"A serious shortage of coal threatens New England this winter. The situation does not warrant neglecting any possible measure of preparedness. For this reason it seems advisable to make a New England campaign for the production of wood on a large scale. Good hardwood properly prepared and dried can be used extensively for domestic purposes as an emergency measure. Wood cut in November can be burned the latter part of the winter, when the coal situation may be most acute. The campaign should also look ahead toward a large supply of wood for next winter when the coal situation may be more serious than this year."

The full attendance at the conference bespoke the interest of everyone in the solution of the fuel problem and conclusions reached were summarized as follows:

1. People throughout New England should be urged to use wood wherever they can do so in order to save coal.

2. It is earnestly recommended that the fuel administrators and the agricultural and other officers throughout the New England states shall urge upon all woodland owners to cut cordwood promptly and extensively.

3. As far as possible portable sawing machinery should be used in order to save the expense of additional handling. In some instances the wood can probably be cut into one foot lengths advantageously. The machinery uses a different class of laborers, reducing the number of skilled laborers required.

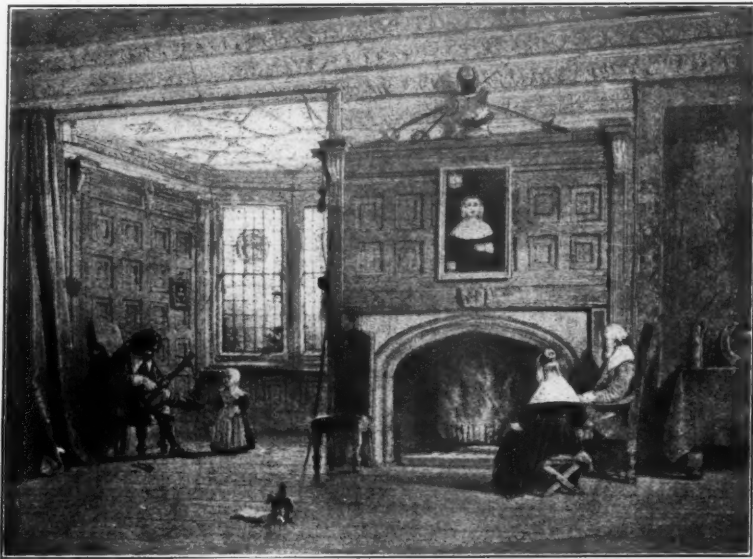
4. In order to secure the best results, local organization is necessary. Leadership and sometimes capital are required, which we believe should come from the local banks and business men.

5. It is recommended that the fuel administrator in each state shall appoint a representative committee from the several counties and wood-using industries, including the State Forester in each state, these committees to take charge of the wood situation under the fuel administrator. Insofar as their judgment approves, local committees in the several towns should be organized in order that the local committees shall protect themselves against extortionary prices.

The Fuel Administrators for each state should appoint committees in each town to canvass all timber land owners and urge upon them the necessity for increasing the cutting of wood not only to be used this winter but for a reserve supply of seasoned wood for next winter. Even where \$2.00 or even \$3.00 per cord is now paid for cutting the wood the owner is receiving more for his stumpage under present prices than he did a few years ago when cutting cost but \$1.00 per cord.

It is clear that woodland owners are, therefore, not being asked to make any financial sacrifices, but just to get a strong grip on the situation and use every effort with available labor to get out more fuel wood and then more during this winter. It must not be forgotten that the opportunity is big to improve our woodlands in this work. Let every reader of AMERICAN FORESTRY take hold and "do his bit" along this line.

THE municipal forest of Baden-Baden, Germany, yields an annual net profit of \$5.25 per acre. Many cities in the United States might have the same income. The town forest of Fosbach, Germany, pays a net profit of \$12.41 per acre per year.



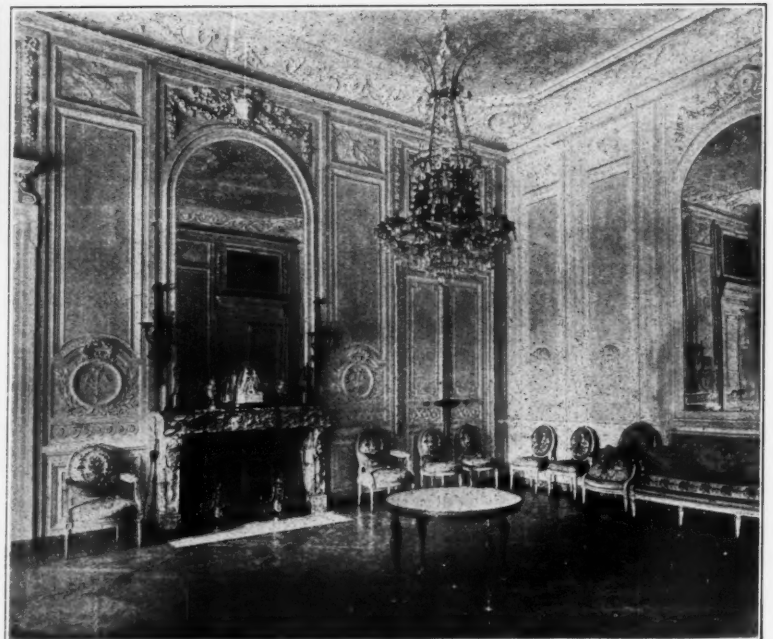
## A PAGE OF REMARKABLE FIREPLACES

AT LEFT—At Haddon Hall, Derbyshire, this old fireplace and the Old English Oak wainscoting is still in existence, though the drawing was made more than half a century ago. It was around fireplaces of this sort that the traditional Christmas of Old England grew. To mention those old celebrations suggests old oak-paneled rooms of this sort and we can hardly think of the rooms themselves without visions of glorious old holidays and the finest traditions of home life.

BELOW—This Dutch kitchen dates from the seventeenth century and is in the Ancient Draperer's House, Leyden. Note the wooden shelf and hood and the tiled walls and floor.



ABOVE—This remarkably Italian looking room is in the residence of William G. Mather, Cleveland, Ohio, and was designed by Charles A. Platt, of New York.



AT RIGHT—The rooms in the Trianons are less elaborate than at Versailles. In this, the *Salon a Musique* at the Grand Trianon, the wooden paneling is painted putty color, and there is none of the gilding of ornament that was used so lavishly by Louis XV at Versailles.

## USING WOOD IN FIREPLACES TO CONSERVE COAL

BY RAWSON W. HADDON

**W**HEN the year gets round to the time immediately before the day when

" . . . baby's hand just touches heaven  
When Daddy lights the tree."

we begin to realize again how important the fireplace is to the final completion of our happiness when we are gathered for the most important holiday of all the year.

But for us, Christmas celebrations this year can hardly take on the lighthearted aspect that they have assumed in former years, though there never has been a Christmas for all the people of this country—unless perhaps it was that dark winter of Valley Forge—in which it was

should indicate an actual fact as well as a picturesque phrase.

It is announced that stringent measures are to be taken by the government for the conservation of the present coal supply, both mined and that which is now in the ground, for use in necessary government and public service establishments.

A single instance of this is the elimination of large and useless (and, from an esthetic viewpoint, most offensively ugly) electric advertising signs, with a resultant saving of hundreds of thousands of tons of coal for use in munition factories and other important industries.

But from this extreme case of hundreds and perhaps thousands of tons a day the duty of economy is distributed among other consumers and rests with equal importance upon the householder, in the use of whose supply of fuel it is also of the greatest importance that strictest economy and judgment be exercised.

At this point the forest is again called upon to do a part in carrying out the plans of the government, and one of the natural suggestions has been that fewer coal fires be used and that more attention be given to the heating of rooms by means of wood fires in open fireplaces. It is proposed that only a minimum temperature be maintained throughout the house and that extra heat, in living rooms for instance, as bed rooms seldom, if ever, need any large amount of heat, be obtained by the use of open fireplaces. Here, however, we must immediately realize the wastefulness of open coal fires and turn to wood for a satisfactory and economical fuel.

Quite outside of what may, with only a small amount of good natured exaggeration, be called the "aspect of military necessity" in this suggestion, fireplace heating has another and equally important point of view.

This is concerned with the fireplace, and the spark-



Photo courtesy Arthur Todhunter.

We have our share of ups and downs,  
Our cares like other folk;  
The pocketbook is sometimes full,  
We're sometimes well nigh broke;  
But once a year, at Christmas time,  
Our hearth is bright to see;  
The baby's hand just touches heaven  
When Daddy lights the tree.

MARGARET E. SANGSTER.

more important for us to realize and cherish and get every possible pleasant hour from our available stock of home atmosphere and home thoughts.

Nor have there been many times when it was so important to inspire those at the front with the assurance that we, at home, are keeping the "home fires burning" to welcome and cheer them when they return. And at this present time, there are good reasons why "the fires"

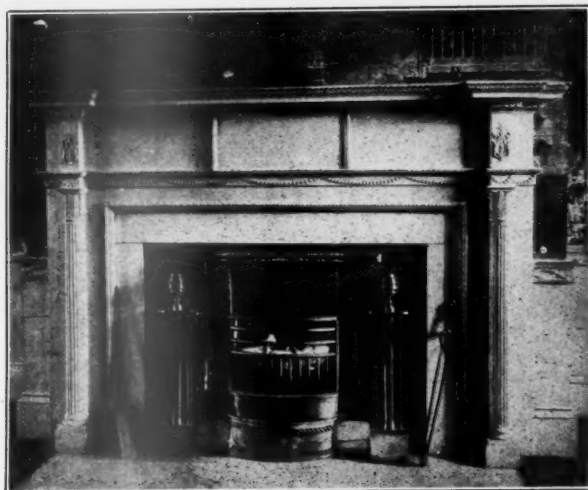


Photo by Frank Cousins.

Mantel in the Cook-Oliver House, Salem, Mass. Designed in 1799 by Samuel McIntire.



ling, crackling warmth of the open fire as one of the most important elements of the decoration of our homes.

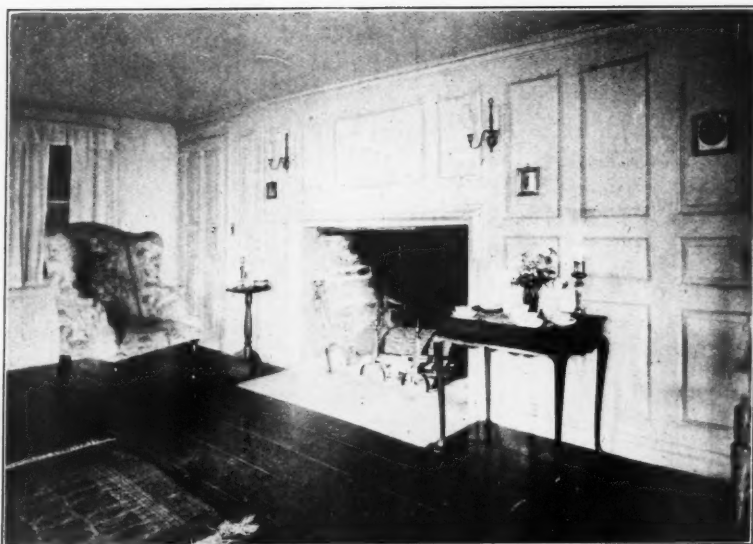
To us of the present day, with all our improvements and labor-saving devices, which are all fine enough in themselves, but which are apt to lessen our consciousness of deeper grounded artistic longings and elements of life, the fireplace has, until very recently, been a neglected quantity.

Indeed we hear far too infrequently nowadays allusions to scenes where, as Robert Bloomfield, the cobbler-poet, said:

"Flat on the hearth the glowing embers lie,  
And flames reflected dance in every eye;"

and too many contemporary American homes have been turned into enormously efficient but rather soulless habitations where the simpler, more graceful sort of ideals are all too easily lost sight of.

In building a fireplace there are many types to choose from. There are the large and elaborate sorts for instance, which were the product of calm and spacious days when magnificence in living was one of the arts of life, and which can be reproduced to advantage in very large and formal houses of the present time. Then, too, there are the simpler and more intimate and homelike products of our own Colonial days, which were built, originally, during a period when the



Living room in an old Colonial House that has been restored by an architect for his own use. Residence of Herbert M. Baer, Westport, Conn.

home fireside was the final goal of existence and when all social and national considerations revolved around it as a central point. Indeed, in all modern periods of history the fireplace has been developed as important an architectural feature as it has been a rallying point of social and family life.

In the earlier types the fireplace opening is extremely large, too enormous by far for present day use, but certain English and early American types are extremely well calculated for use today.

The design of the fireplace is, in fact, the one important keynote in the successfully decorated room. Much is gained, too, by building the fireplace into a paneled wall, as the majority of those illustrated are built.

In English houses the paneling is generally carried around four walls of the room, while in the American examples only one wall was paneled and the remaining ones were plastered or papered. This shows in the photograph which heads this article and the plastered side wall can be seen in the illustration of the living room of Mr. Baer's house.

In the design it is important that the use for which the room is intended be taken into consideration, and that it be in character and harmony with the room and with the furnishing to be placed in it.

Roughly speaking, there are three general types of fireplace which are used at the present time. An example of the most elaborate type is found in Georgian work such as that in the drawing room at Belton, of which an interesting reproduction has been carried out by the Hayden Company of New York, and reproduced through their courtesy.

The structural work in this room is built of English oak and the elaborate wood carvings executed in old pear wood. The mantel itself, as in the original, is executed in marble as a contrast to the large amount of woodwork otherwise used. In finishing the wood it was thoroughly stained, and waxed to bring out its fine nat-



Photo courtesy of the Hayden Co.

A reproduction of an old English paneled room of most elaborate design. The paneling is oak and the carvings in old pear wood.

ural color. In this English type the fireplace opening is in itself rather small in comparison to the scope of the whole design. A very much stronger and more definite note is struck by the picture and carving over the mantel which are, in themselves, important and necessary parts of the composition, making the mantel frame and the "over mantel" together form the entire and distinct feature of design.

In the fireplace and paneling in Mr. Baer's house, on the other hand, an entirely different scheme, and different theory of design is found. In this latter type the overmantel is subordinated in importance to a large and ample fireplace opening. In this case it will be noted that no decoration whatever is found in the place occupied by the picture and the carving in the Belton example, and the fire opening is in this way emphasized and made the important element of design. This emphasis upon the opening itself is further accentuated by the absence of any mantel shelf and the use of a single bold and emphatically simple molded frame. This is a good example of early Colonial work and illustrates a type of wall treatment that deserves the careful and earnest consideration of the home builder of today.

"The paneling shown in this room," writes the architect, "was taken out of an old house of about the same period as that of my own residence and dates, approximately, from the year 1750. It was delivered at my house in absolutely original condition, and, as antique buyers say, 'in the rough.' Built of local pine, it had in the course of years received coat upon coat of paint, some good and some of extremely poor quality. Much of this had been chipped off and in order to finish the woodwork properly after it was set up in the room, it was necessary to burn off a large part of this paint and to carefully scrape off the remainder. After this, the woodwork was given two and then three coats of paint which I selected as being without any doubt the best for the purpose. Finally a coat of flat enamel was applied. The importance of the selection of proper paint cannot be over-emphasized. Between each coat, to make a good job, the paint should be properly sandpapered."

The last of the three types occupies a middling course between the two extremes already discussed and is found illustrated in the mantels most frequently found in later Colonial and English work and which may be illustrated by the mantel heading this article and by an interesting one in Salem, designed by Samuel McIntire and erected in 1799. This latter type is more often used than the earlier Colonial one and perhaps is justly the more popular scheme. Certainly it fits better in the unpaneled room and it suggests a cer-

tain informality and homelikeness which, though making its use impossible in the formally arranged or decorated room, makes its use advisable in a far greater number of conditions than is possible in the case of either of the previous types.

While the Salem example is an authentic antique and probably built, also, of some local wood, the illustration which appears over the verse on the first page is quite modern in erection, but is an exact reproduction of an old mantel now in the possession of Mr. Arthur Todhunter, of New York city, who has done much to further art appreciation in the home by the many splendid products of his business. Such mantels and fireplace furnishings from well designed antique models are within the reach of every house builder at a cost very often far smaller than would be necessary for the purchase of considerably inferior designs elsewhere.

It will be noted that this third type of mantel is designed quite independently of the surrounding wall. And while it is found both in paneled and in plastered rooms it has no more actual decorative relation to one than to the other. While the first type, to be successful, must be designed with an equally important overmantel, and the second type derives its entire success from the absence of the same, and loses much of its effectiveness if the space above it is not left severely unornamented. The space over this third type is left to be decorated as the house furnisher wishes. An old pictorial paper makes decorations impossible in the Salem example, but the other illustration shows the scope left to personal taste in the matter of mirrors and mantel shelf decorations.

The structural materials selected for the work, and the manner in which these are finished is important. When the decorative scheme calls for woods left in rich natural colors materials must be selected with care both with regard to their color and wearing qualities. In recent work many interesting results have been obtained with practically every domestic wood. Much work could be illustrated in which results of the greatest interest and merit have been obtained in the use of American oak, red gum, walnut, cypress and many others. For work which is to be finished with heavy coats of paint or enamel (which must be selected with care and in the light of the conditions that maintain in the paint market at the present day) the favorites seem to be, to name only a few, pine, spruce, maple, cypress and others.

And finally, when all is said and done and we have had our artistic appreciation and all the homelike coziness that an open fire will give, we need in no wise look upon our enjoyment as a selfish extravagance or

a self indulgence, but rather as a sacrifice that our brothers and fathers may thereby be furnished with those things that will assure for them safety and some degree of comfort and a final happy issue out of this present great conflict in which they, in far distant lands, are fighting so bravely and so unselfishly for the protection of our homes and of the lives of those who are dearest to them—and to us.

In itself the contribution to the grand total seems a pitiful and an insignificant one, but it so happens that from our seemingly unimportant economy in this one particular, and from our saving of coal that follows as a result of this use of wood fires, we have a positive assurance that we are making possible the production of materials for the final and complete crushing of that hideous and monstrous and almost unspeakably degraded and cruel enemy that comes to our very doors threatening our lives and menacing the continuance of our best traditions and those ideals for the establishment of which our forefathers laid down their lives long years ago.

Those who are now at the front, and those who will soon be there, will be most in your thoughts this Christmas Day and they will be glad to know that you at home are helping in all, even in these apparently unimportant ways.

Through all the long months that they must spend on foreign soil and during which they must contend with the necessary privations of war, it will inspire them to greater and nobler efforts to know that you are comfortably established at home, out of the way of harm, and keeping up those traditions and conditions to which they hope, after their final, glorious victory, to return.

And, in doing this, in lighting your fireplace, you have the satisfaction of knowing that every wood fire, every additional cord of wood and every ton of coal saved in home use means almost untold protection to your soldiers in the form of the possible additional production of ammunition for their use. Every cloud of smoke ascending from our chimneys, where it comes from a wood fire, means just so much fuel saved to prevent the ghastly conditions caused by a shortage of ammunition that brought about those horrible catastrophes in Russia—and more recently on the Italian front.

Victorious advances will require far more munitions than defensive campaigns and in the future as victories increase the need of straining every energy to supply these munitions will be necessary. You, the government knows, will assist in this by using less and less coal at this time and by substituting for it comfortable fires of wood. A small sacrifice, surely, even at its very worst, for so good a cause.

## AMERICAN FORESTERS IN MILITARY SERVICE

This list is compiled from various sources. Every effort has been made to make it complete and accurate, but in the nature of things there are necessarily omissions and errors. The list will be reprinted and increased from month to month. All foresters and others who can supply additional names or note corrections are urged to communicate with American Forestry as promptly as possible, to the end that the list may have full value as a record of the men who have gone to war.

- A** GEE, Fred B., Deputy Forest Supervisor, U. S. F. S.  
 Albano, Jack, forest ranger, U. S. F. S.  
 Aldous, Tura M., grazing, U. S. F. S.  
 Alexander, Ben, (Bilt. For. School), 2nd R. O. T. C.  
 Alexander, J. B., 1st Lt. Aviation Corps, (Uni. of Wash., '17).  
 Allen, Raymond, New Jersey.  
 Ames, F. E. (Yale For. School '05).  
 Anderson, A. C., 2nd Lt. U. S. A. (Uni. of Wash., '17).  
 Anderson, Emil A., deputy forest supervisor, U. S. F. S.  
 Archer, Frank L., forest clerk, U. S. F. S.  
 Armstrong, Carroll W. (Bilt. For. School) Quartermaster's Dept., Fort Dodge.  
 Armstrong, Ralph H. (Bilt. For. School), 104th Inf., Expeditionary Forces, France.  
 Atkinson, E. S., (Yale For. School, '16).  
 Atwood, C. R. (Univ. of Maine, '15), manager, Unit 1, New England Sawmill Units.  
 Avery, B. F., commissioned in Eng. (Forest) forces; (Yale For. School); Spanish River Pulp and Paper Mills.  
 Aylward, F. N. (Univ. of Calif.), Ambulance Corps.
- B** ADERTSCHER, Ed., temporary clerk, U. S. F. S.  
 Baker, Hugh P. (Yale For. School, '04), N. Y. State Col. of Forestry.  
 Baldenburg, Max B., clerk, U. S. F. S.  
 Barker, S. Omar, Co. D., 502nd Service Bn., Camp Merritt, N. J. U. S. F. S.  
 Barlow, Harold (Yale For. School, '14).  
 Barr, John B., forest ranger, U. S. F. S.  
 Barton, Robert M., 20th Engineers (Forest), American University, Wash., D. C.; forest ranger, U. S. F. S.  
 Bastian, Clyde E., Corp. 20th Eng. (Forest), (Uni. of Mich., '16).  
 Batten, R. W. (Yale For. School, '16).  
 Beaman, Clarence W., messenger, U. S. F. S.  
 Beattie, Homer Milo (Mich. Univ., '04), sergt. 10th Engineers (Forest).  
 Bedwell, Jesse L., forest ranger, U. S. F. S.  
 Behre, C. Edward, 20th Engineers (Forest), American University, Wash., D. C., U. S. F. S.  
 Bell, George R. (Yale For. School, '18).  
 Bellue, A., 10th Engineers (Forest).  
 Benedict, M. S., 1st Lt. 10th Eng. (Forest), for. sup., U. S. F. S.  
 Benedict, Raymond E., Major 10th Eng. (Forest), For. Br. B. C.  
 Bentley, George A., Capt. Quartermaster's Dept., purchasing agent U. S. F. S.  
 Bennett, Edwin L., forest ranger, U. S. F. S.  
 Bennett, William W., Co. E. 314 Ammunition Train, Camp Funston, Ft. Riley, Kansas, U. S. F. S.  
 Bernhardt, Carl L., (Uni. of Wash., '18).  
 Berry, John K., scaler, U. S. F. S.  
 Berry, Swift, forester, U. S. F. S.  
 Betts, Fred H., forest ranger, U. S. F. S.  
 Bevan, Arthur (Uni. of Wash., '17).  
 Billingslea, James H., Jr., Top Sergeant (Uni. of Wash., '14), forest ranger, U. S. F. S.  
 Bird, R. L., Corp. 20th Eng. (Forest), (Cornell, '16).  
 Bird, Vern A., forest ranger, U. S. F. S.  
 Bloom, Adolph, Ensign U. S. N. Train. Sta. (Uni. of Wash., '16).  
 Bonney, Parker S., Sub. Lt. British Navy (Uni. of Wash., '13).  
 Bosworth, James H., 20th Engineers (Forest), American Univ., Wash., D. C., U. S. F. S.  
 Bowen, John S., 20th Engineers (Forest), American Univ., Wash., D. C., U. S. F. S.  
 Bowen, Jos. B. (Yale For. School, '17).  
 Bradley, Tom O. (Mt. Alto), Pa. Dept. For.  
 Brady, Charles C. (Uni. of Wash., '18).  
 Brady, Seth C., messenger, U. S. F. S.  
 Breneman, Howard E. (Mt. Alto For. Acad., '17), Co. C., 10th Eng. (Forest), Pa. Dept. For.  
 Brewster, Donald R., forest examiner, U. S. F. S.  
 Brickerhoff, H. E. (Yale For. School), 1st Lt. Inf.  
 Brindley, Ralph, 2nd Lt. R. O. T. C. (Uni. of Wash., '17).  
 Brockway, M. (Univ. of Me., '15), checker, Ten Saw Mill Units.  
 Brooks, James F., forest ranger, U. S. F. S.  
 Brown, Bascom H., forest ranger, U. S. F. S.  
 Brown, R. A., Co. D, 23d Engineers, Camp Meade, Md., U. S. F. S.  
 Brown, Vance, scaler, U. S. F. S.  
 Browning, Harold A., asst. forest ranger, U. S. F. S.
- Broxon, Donald (Uni. of Wash., '14).  
 Bruce, Donald, Prof. of For., Uni. of Cal. (Yale For. School, '10; assigned in charge of timber reconnaissance in France.  
 Bryant, Edward S., Capt. 10th Eng. (Forest), for. ins., U. S. F. S.  
 Buch, John Edward (Mt. Alto For. Acad., '17), Co. C., 10th Eng. (Forest), Pa. Dept. For.  
 Buck, Shirley, National forest inspector, U. S. F. S.  
 Bullerdick, Ray O., Supply Office, Camp Tanafarro No. 1, Ft. Worth, Texas, U. S. F. S.  
 Bunker, Page (Yale), city forester, Fitchburg.  
 Burgess, John, surveyor draftsman, U. S. F. S.  
 Burnham, R. P. (Uni. of Wash., '17).  
 Ruttrick, P. L., Amer. Ambulance Serv. (Yale For. School, '11).  
 Byrne, Geo. J., Jr., Ambulance Corps.
- C** ALKINS, Hugh G. (Yale For. School, '09), forest supervisor, U. S. F. S.  
 Calloway, G. A. (Uni. of Mo.).  
 Calloway, Joseph R., forest ranger, U. S. F. S.  
 Calvert, Gerald F. (Uni. of Wash.).  
 Cameron, J. F. (Uni. of Wash., '19).  
 Carney, Thos. J., 38th Co. 10th Battalion, 166th Depot Brigade, Camp Lewis, American Lake, Washington, U. S. F. S.  
 Carpenter, Herbert M. (Bilt. For. School), 20th Eng. (Forest).  
 Cappel, Frederick, forest clerk, U. S. F. S.  
 Cassidy, Hugh O., forest ranger, U. S. F. S.  
 Cecil, Kirk P., surveyor, U. S. F. S.  
 Chudderdon, Harold A., forest ranger, U. S. F. S.  
 Chamberlain, Harry A., forest ranger, U. S. F. S.  
 Chapman, Charles S., Major 10th Eng. (Forest), (Yale For. School, '02), forestry assistant, U. S. F. S.  
 Chartrand, Lee F., 20th Eng. (Forest), forest ranger, U. S. F. S.  
 Charlson, Alex., (Uni. of Wash., '16).  
 Christensen, Alfred C., forest clerk, U. S. F. S.  
 Clark, Donald H., 1st Lt. R. O. T. C. (Uni. of Wash., '17).  
 Clark, E. V., 1st Lieut.; R. O. T. C., forest supervisor, U. S. F. S.  
 Clemmons, Walter C., forest ranger, U. S. F. S.  
 Colledge, Edward W. (Bilt. For. School), Am. Ambulance Service, France.  
 Colburn, H. C., 10th Eng. (Forest), Co. B., Expeditionary Forces, France, U. S. F. S.  
 Condon, H. R., 2nd Lt. 10th Eng. (Forest), Pa. R. R. forester.  
 Conklin, J., 20th Eng. (Forest).  
 Conklin, W. Gardiner, 1st Lt. 20th Eng. (Forest), (Pa. State For. Acad., '08), Pa. Dept. Forestry.  
 Cook, A. M. (Yale For. School, '08).  
 Cook, John W., clerk, U. S. F. S.  
 Cook, G. D. (Mich. Agri. College), 1st sergt. 10th Eng. (Forest).  
 Cook, H. O., Capt., 2nd Forest Regiment, Massachusetts.  
 Cook, Samuel, forest ranger, U. S. F. S.  
 Cookston, Roy, Capt. 10th Eng. (Forest).  
 Coolidge, Lieut. Joseph (Harvard, '12), 20th Eng. (Forest), consulting forester.  
 Copey, C. N., 10th Eng. (Forest).  
 Cope, H. Norton, forest ranger, U. S. F. S.  
 Cowan, T. DeWitt, 20th Engineers (Forest), American Univ., Wash., D. C., U. S. F. S.  
 Cowman, Talmadge D., forest ranger, U. S. F. S.  
 Critchley, Horace F. (Mt. Alto, '13), Res. Off. Tr. Camp, Ft. Niagara, Pa. Dept. For.  
 Crookston, Byron F., 27th Engineers (Forest), American Univ., Wash., D. C., U. S. F. S.  
 Crowell, Lieut. Lincoln J. (Yale, '08, Bilt., '11), 20th Eng. (Forest), U. S. F. S.  
 Crumb, Isaac J. (Uni. of Wash., '20).  
 Cuff, Ivan A., forest ranger, U. S. F. S.  
 Culley, Matthew J., forest ranger, U. S. F. S.  
 Cuno, John R., 2nd Lt. 20th Eng. (Forest).  
 Curwen, William H., surveyor-draftsman, U. S. F. S.
- D** ALLENBACH, Emil, messenger, U. S. F. S.  
 De Camp, J. C., grazing assistant, U. S. F. S.  
 Deering, Robert L., 1st Lt. 10th Eng. (Forest), forest examiner, U. S. F. S.  
 D'Amour, Lieut. Fred E., 33rd Inf., Co. L., O. R. C.  
 Davis, V. B., 20th Eng. (Forest).  
 Devine, Lieut. Robert (Mass. Inst. Tech.), training camp.  
 Deutsch, Henry C., forest ranger, U. S. F. S.



Dodd, C. T., 20th Eng. (Forest).  
 Dodge, Alex W. (Yale), 1st sergt. 32nd Co., 8th Bat., Camp Lewis, Amer. Lake, Wash.  
 Doggett, William H. (Yale For. School, '17).  
 Dorrance, John Gordon (Biltmore, '10), 2nd Lt. E. O. R. C., Md. State Board of Forestry.  
 Dorward, D. L. (Yale For. School, '14).  
 Douglass, C. W. H., Aviation Corps (N. Y. State Col. of Forestry, '15), American Forestry.  
 DuBois, Coert, Major 10th Eng. (Forest), dis. forester, U. S. F. S.  
 Dubuar, James F., forest assistant, U. S. F. S.  
 Dunbar, Roger S. (Bilt.), 20th Eng. (Forest).  
 Dunn, Beverly C., Adjutant 10th Eng. (Forest).  
 Dunning, Duncan, forest assistant, U. S. F. S.  
 Dunning, Earle (Bilt.), Quartermaster's Dept.  
 Dunston, Clarence R., 1st Lt., U. S. Indian Service.  
 Dunwoody, Capt. W. Brook (Yale, '16), 3rd Field Art., Ft. Myer, Va., 2nd Asst. State Forester Va.

**E**LDREDGE, Inman F., Capt. 10th Eng. (Forest), forest supervisor, U. S. F. S.  
 Elliott, Harry K., forest ranger, U. S. F. S.  
 Eddy, Ben, 23rd (Highway) Engineers, U. S. F. S.  
 Egnor, James W., MacCormack State Park, Indiana.  
 Elliott, F. A., 10th Eng. (Forest).  
 Ellis, Ralph T., woodsman, Ten Sawmill Units (Mass For. Dept.).  
 Emerick, Lloyd P., forest clerk, U. S. F. S.  
 Emerson, Fred D. (Bilt.), Camp Dix.  
 Emerson, J. Ward, forest ranger, U. S. F. S.  
 Estill, Davis H. (Bilt.), corporal, Inf.  
 Euchern, Wm. H. (Bilt.), 20th Eng. (Forest).  
 Evans, Vincent (Uni. of Wash., '16).  
 Everett, E. W., 20th Eng. (Forest).  
 Ewing, Robert B., forest ranger, U. S. F. S.

**F**AIRCHILD, Rollin A., forest clerk, U. S. F. S.  
 Fiiter, Charles (Uni. of Wash., '20).  
 Fish, Harold (Uni. of Wash., '18).  
 Fisher, David (Uni. of Wash., '14).  
 Foerster, M. H., 41st Co., 11th Bat., Camp Zachary Taylor, Louisville, Ky.  
 Foess, Jacob E., 20th Eng. (Forest), (Mich. Ag. Col., '17).  
 Foley, A. C., Corp. 20th Eng. (Forest), (Uni. of Mich., '18).  
 Foran, Harold (Uni. of Wash., '16).  
 Ford, Earl J., woodsman, Ten Sawmill Units, England (Mass. Forestry Dept.).  
 Ford, Elmer R. (Penn. State, '14), Officers' Training Camp, Fort Myer (Assist. For. Md. St. Bd. of For.).  
 Fowler, Frederick H., district engineer, U. S. F. S.  
 Frankland, James, forest ranger, U. S. F. S.  
 Fritchle, C. R. (Uni. of Mo.).  
 Fritz, Emanuel (Yale For. School, '14), forest asst., U. S. F. S.  
 Freedman, Lieut. Louis J. (Harvard), Eng. Corps (Forest).  
 Frey, E. (Cornell, '17), 10th Eng. (Forest).  
 Fullenwider, William G. (Bilt.), 10th Eng. (Forest).  
 Fuller, Francis S., forest assistant, U. S. F. S.

**G**ALER, George E., forest ranger, U. S. F. S.  
 Gallaher, W. H., 2nd Lt. (Yale For. School, '10), U. S. F. S.  
 Garrett, C. B. (Uni. of Wash., '16).  
 Gaylord, Donald (Yale For. School, '15).  
 Gearhardt, Paul H., Battery E., 316 Rg., H. F. A., Camp Jackson, S. C.  
 Geary, H. O., 20th Eng. (Forest).  
 Gebo, L. W., 20th Eng. (Forest), (Cornell, '16).  
 Gibbons, William H., 2nd Lt., forest examiner, U. S. F. S.  
 Gill, Thomas H. (Yale For. School, '15), forest ranger, U. S. F. S.  
 Gilman, John, forest ranger, U. S. F. S.  
 Gilson, R. M. (Yale For. School, '17).  
 Girk, Royal J., forest clerk, U. S. F. S.  
 Given, J. Bonbright, 1st Lt., Camp Jackson, S. C.  
 Godwin, D. P., 1st Lt. 10th Eng. (Forest), forest exam., U. S. F. S.  
 Gooch, Winslow L., 10th Engineers (Forest), American Exped. Forces, France, U. S. F. S.  
 Goodman, Walter F., forest ranger, U. S. F. S.  
 Gowen, Geo. B., Coast Artillery.  
 Graham, Paul (Uni. of Wash., '13).  
 Granger, C. M., assistant district forester, U. S. F. S.  
 Graves, Henry S., Lt. Col., director, division of forestry headquarters, American Expeditionary forces; United States Forester.  
 Greathouse, Ray Livingston, Co. A., 362 Infantry, Camp Lewis, American Lake, Washington, U. S. F. S.  
 Greeley, William B., Major, deputy director, division of forestry headquarters, American Expeditionary forces; assistant United States Forester.  
 Grefe, Raymond F., forest ranger, U. S. F. S.  
 Grinnel, Henry (Bilt.), Forest Regiment.  
 Guthrie, John D. (Yale For. School, '06), forest sup., U. S. F. S.

Guthrie, Richard T., forest examiner, U. S. F. S.  
 Gwin, Clyde M., Camp Lewis, American Lake, Tacoma, Washington, U. S. F. S.

**H**AASIS, F. W., (Yale For. School, '13), Regular Army, Medical Dept.  
 Hackett, William, forest ranger, U. S. F. S.  
 Hagon, Jules L., 20th Engineers (Forest), for. ranger, U. S. F. S.  
 Hall, A. F., 20th Engineers (Forest).  
 Hall, F. B., woodsman, Ten Saw Mill Units, Mass. Dept. of For.  
 Hall, R. C. (Yale For. School, '08), forest examiner, U. S. F. S.; assigned to timber reconnaissance in France.  
 Hall, Stanley B. (Harvard, '09).  
 Hammer, George C., Neopit Indian Mills, Neopit, Wis.  
 Hammond, Charles P. (Biltmore), 20th Engineers (Forest).  
 Hansen, Harvey L. (Univ. of Calif.), Ambulance Corps.  
 Hansen, Thorvald (Yale For. School, '17), forest asst., U. S. F. S.  
 Hansson, Arnold (Yale For. School, '17).  
 Harding, Charles C. (Yale For. School, '16).  
 Harlachner, Josef (Mt. Alto, '17) 20th Eng. (Forest), 1st Bat., Pa. Dept. For.  
 Harley, Percy H., forest clerk, U. S. F. S.  
 Harrington, Neal (Mich. For. School, '12), Company G., 341 Inf., Camp Grant, Rockford, Ill.  
 Harmelling, H. (Uni. of Wash., '12).  
 Harris, Alvin E., 20th Engineers (Forest), American University, Wash., D. C., U. S. F. S.  
 Hendrickson, Guy C., forest clerk, U. S. F. S.  
 Hendrix, Albert W., forest ranger, U. S. F. S.  
 Hicock, Henry W. (Yale For. School, '15).  
 Hicks, L. E., forest ranger, U. S. F. S.  
 Hill, F. C., forest ranger, U. S. F. S.  
 Hill, Rollin C., 10th Engineers (Forest), American Exped. Forces, France, U. S. F. S.  
 Hilliard, L. E., woodsman, Ten Saw Mill Units, England; Mass. For. Dept.  
 Hirst, E. C. (Yale For. School, '09), state for., New Hampshire.  
 Hogentoler, Joseph R. (Mt. Alto, '12), with Governor's troops, Pa. Dept. For.  
 Holt, Felix R. (Yale For. School, '02).  
 Honeycutt, E. E., 20th Engineers (Forest).  
 Hotze, E. B. (Uni. of Mo.).  
 Hope, L. S. (Yale For. School, '16).  
 Hout, William E. (Mt. Alto, '09), 20th Eng. (Forest), formerly Pa. Dept. For.  
 Houtz, Jesse (Mt. Alto, '13), Field Artillery, Camp Meade, Md., formerly Pa. Dept. For.  
 Huff, Rolland, forest ranger, U. S. F. S.  
 Hull, J. H. (Yale For. School, '11).  
 Humphrey, J. C. H. (Yale For. School, '09).  
 Hussey, Ralph W., forest ranger, U. S. F. S.

**I**NGALLS, E. E. (Yale For. School, '17).  
 Inskeep, Raymond P., forest ranger, U. S. F. S.  
 Isola, Vico C. (Yale For. School, '14).  
 Irwin, James A. (Mt. Alto, '12), Sergt., 10th Eng. (Forest), France, formerly Pa. Dept. For.

**J**ANOUGH, Karl L., forest ranger, U. S. F. S.  
 Johnson, O. S., Sgt. 20th Eng. (Forest) (Uni. of Minn., '16).  
 Jones, E. F., forest examiner, U. S. F. S.  
 Johns, Walter Ridgley, 158 Co., 35 Battalion, 166th Depot Brigade, Camp Lewis, American Lake, Washington, U. S. F. S.  
 Johnson, F. W. (student, Ohio State), 10th Engineers (Forest).  
 Jones, Luther G. (Yale For. School, '16).  
 Judson, Luchard (Yale For. School, '17).

**K**ELLEY, Evan W., Capt. 10th Eng. (Forest), forest examiner, U. S. F. S.  
 Ketcham, Louis, forest ranger, U. S. F. S.  
 Kaestner, H. J., Forester of West Virginia.  
 Kelley, Capt. Arthur L. (Colo. Ag. Col.), 19th Co., Inf., O. R. C.  
 Kenny, John, woodsman, Ten Saw Mill Units, Mass. For. Dept.  
 Kephard, G. S. (Cornell, '17), 10th Eng. (Forest).  
 Keyes, John H., 20th Eng. (Forest), (Yale, '14).  
 Kettridge, John C., forest examiner, U. S. F. S.  
 Kiefer, Francis, Capt. E. O. R. C., asst. dist. forester, U. S. F. S.  
 Kilmer, William F. (Biltmore), Co. B., Signal Corps, Camp Sheridan, Ala.  
 Kimball, George W., forest examiner, U. S. F. S.  
 King, Robert F., 2nd Lt. Coast Artillery (Uni. of Wash., '19).  
 Kingsley, Ray M., forest ranger, U. S. F. S.  
 Kittredge, Joseph, Jr., forest examiner, U. S. F. S.  
 Klobucher, F. J. (Yale For. School, '16), forest ranger, U. S. F. S.  
 Knowlton, H. N., engineer in forest products, U. S. F. S.  
 Kobbe, William H. (Yale For. School, '04).  
 Koomey, L. H. (Yale For. School, '12).  
 Kraebel, Charles J., forest assistant, U. S. F. S.  
 Kraft, F. G. (Uni. of Mo.).

Krause, John E., forest ranger, U. S. F. S.  
 Krell, Frederick C. (Penn State, '13), sergt. 1st class, 10th Eng. (Forest), Asst. Forester Pennsylvania Railroad.  
 Krueger, Myron E., 20th Engineers (Forest), forest ranger, U. S. F. S.

**L**AFON, John, Capt. 10th Eng. (Forest), Forest Branch B. C. Langville, H. D., Major 505th Serv. Regt.  
 Larzon, Arthur K. (Uni. of Wash.).  
 Lee, Chester A. (Yale For. School, '17).  
 Leach, Walter (Mt. Alto, '14), 314th Inf., Camp Meade, Md., Pa. Dept. For.  
 Lentz, Gustav H. (Yale For. School, '17), Sergt., 10th Eng (Forest).  
 Lewis, Ferry D., forest ranger, U. S. F. S.  
 Lindsey, Eugene L., 1st Lt. 10th Eng. (Forest), (Yale For. School, '19), forest examiner, U. S. F. S.  
 Littlefield, Theron R., forest ranger, U. S. F. S.  
 Lockwood, Milton K. (Biltmore), 1st Lt., Camp Jackson, S. C.  
 Loud, William D., 20th Eng. (Forest).  
 Loveman, A. M. (Yale For. School, '16).  
 Lowdermilk, Walter C., 10th Engineers (Forest), American Exped. Forces, France, U. S. F. S.  
 Lundgren, Leonard, Captain, engineer, U. S. F. S.  
 Luther, T. F., 20th Eng. (Forest), (Cornell, '17).

**M**ACKECHNIE, A. R., 2nd Lt. U. S. A. (Uni. of Wash., '18).  
 Malmstein, Harry E., grazing assistant, U. S. F. S.  
 Markworth, Gordon D. (Yale For. School, '17), 20th Eng. (Forest), Va. State For. Dept.  
 Marsh, A. Fletcher (Yale For. School, '11).  
 Masch, Walter (Mt. Alto), 20th Eng. (Forest), Pa. Dept. For.  
 Marston, Charles O. (Biltmore), 10th Engineers (Forest).  
 Marston, Capt. Roy L. (Yale), 103rd U. S. Inf., Co. E, France.  
 Mason, David T., Capt. 10th Eng. (Forest), Uni. of Cal. (Yale For. School, '07).  
 McCullough, Thomas E. (Yale For. School, '11).  
 McGillicuddy, Blaine (Uni. of Wash.).  
 McGlaughlin, Eugene R., 20th Eng. (Forest), (Ohio State Uni.).  
 McKnight, Roscoe, 1st Lt. 10th Eng. (Forest), U. S. F. S.  
 McNulty, L. Edgar (Mt. Alto For. Acad., '17), Co. C., 10th Eng. (Forest), Pa. Dept. For.  
 McPherson, Benj. D. (Mt. Alto For. Acad., '16), 10th Eng. (Forest), Pa. Dept. For.  
 Meek, Chas. R. (Mt. Alto, '12), 20th Eng. (Forest), Co. A., 3rd Bat., Pa. Dept. For.  
 Meloney, Henry M., 20th Eng. (Forest), forest ranger, U. S. F. S.  
 Mendenhall, Fred D., surveyor-draftsman, U. S. F. S.  
 Mershon, William B. (Biltmore, '10), 10th Eng. (Forest), sergt. 1st class.  
 Mesch, Walter (student at Mt. Alto), 20th Engineers (Forest).  
 Meschke, Karl G., 20th Eng. (Forest), forest assistant, U. S. F. S.  
 Meyer, L. A., 10th Eng. (Forest).  
 Meyer, Leo W. (Yale For. School, '17).  
 Middour, Joseph C. (Mt. Alto For. Acad., '16), Co. C., 10th Eng. (Forest), Pa. Dept. For.  
 Miles, Clark, forest examiner, U. S. F. S.  
 Millar, W. N., Capt. 10th Eng. (Forest), (Yale For. School, '08).  
 Miller, Edwin B. (Mt. Alto For. Acad., '17), 10th Eng. (Forest), France, Pa. Dept. For.  
 Miller, Fred H., forest ranger, U. S. F. S.  
 Minner, Clifford R., forest ranger, U. S. F. S.  
 Modisette, W. M. (Biltmore), 1st Lt. U. S. Cavalry.  
 Moir, W. Stuart (Yale For. School, '17).  
 Mongrane, Joe, woodsman, Ten Saw Mill Units (Mass. For. Dept.).  
 Montgomery, Ray C., forest ranger, U. S. F. S.  
 Montgomery, W. E. (Mt. Alto, '13), Res. Off. Tr. Camp, Augusta, Ga., Pa. Dept. For.  
 Moody, Capt. F. B., Engineer Officers' Reserve Corps.  
 Moore, Barrington, Capt. (Yale For. School, '08), U. S. F. S.  
 Moore, W. M., forest examiner, U. S. F. S.  
 Morrison, Tom, 10th Engineers (Forest), American Exped. Forces, France, U. S. F. S.  
 Morton, J. Newton (Mt. Alto For. Acad., '16), Co. C., 10th Eng. (Forest), Pa. Dept. For.  
 Mosch, Walter (Mt. Alto) 20th Eng. (Forest), Pa. Dept. For.  
 Murphy, Frank T., 20th Engineers (Forest), American Univ., Wash., D. C., U. S. F. S.  
 Murphy, E. C., 2nd Lt. U. S. A. (Uni. of Wash., '20).  
 Murphy, R. A. (Yale For. School, '17).  
 Mutz, George, forest ranger, U. S. F. S.  
 Muzzall, A. H., 10th Engineers (Forest).  
 Myers, Frank B., forest assistant, U. S. F. S.  
 Myers, Edgar (Cornell, '17), 10th Engineers (Forest).  
 Myers, Reynolds V. (Biltmore), senior non. 10th Eng. (Forest).

**N**ELSON, Enoch W., grazing assistant, U. S. F. S.  
 Nelson, Oscar L., forest ranger, U. S. F. S.  
 Nevitt, John V., forest ranger, U. S. F. S.

Naramore, David C. (Biltmore), 20th Engineers (Forest).  
 Neasmith, John J., 20th Eng. (Forest), (Syracuse, '17).  
 Nordstrom, Edw. E., woodsman Ten Saw Mill Units (Mass. Forestry Dept.).  
 Norton, J. Newton (Mont. Alto, '16), 10th Engineers (Forest), Co. C., France.  
 Norton, Thomas E., 20th Engineers (Forest), American University, Washington, D. C., for. rang., U. S. F. S.  
 Nye, Elmer L., 20th Engineers (Forest), American Univ., Wash., D. C., U. S. F. S.

**O**AKLEAF, H. B., forest examiner, U. S. F. S.  
 Odell, W. T. (Uni. of Wash., '12).  
 Oliver, J. Earl, forest ranger, U. S. F. S.  
 Oles, W. S., 20th Eng. (Forest), (Cornell, '16).  
 Orr, Ronald H., 20th Eng. (Forest), (Biltmore For. School, '09).  
 O'Shea, Thomas E., woodsman, Ten Saw Mill Units (Mass. Forestry Dept.).  
 Otis, David B. (Biltmore), 1st Lt., Camp Dix.

**P**AETH, William J. (Yale For. School, '12), forest assistant, U. S. F. S.  
 Paine, F. R. (Yale For. School, '14).  
 Pagter, Lawrence B., 20th Engineers, forest examiner, U. S. F. S.  
 Paine, Topliff O., forest ranger, U. S. F. S.  
 Partridge, Herbert E. (Biltmore).  
 Paxton, Percy J. (Yale For. School, '09), forest exam., U. S. F. S.  
 Peabody, Joseph, 20th Eng. (Massachusetts For. Dept.).  
 Peck, Allen S., Major, 10th Eng., '09, forest insp., U. S. F. S.  
 Peck, E. C. (Yale For. School, '18)).  
 Perry, Edgar L., 10th Engineers (Forest), American Exped. Forces, France, U. S. F. S.  
 Perry, Jr., R. E. (Cornell, '17), 10th Engineers (Forest).  
 Pilcher, Rufus J., forest ranger, U. S. F. S.  
 Plummer, Donald (Uni. of Wash., '20).  
 Port, Harold F. (Mt. Alto For. Acad., '16), Co. A., 10th Eng (Forest), France, Pa. Dept. For.  
 Porter, O. M. (Yale For. School, '13).  
 Powell, Harry A., British Army, (Uni. of Wash.).  
 Powers, James E. (Mt. Alto, '15), Artillery, Pa. Dept. For.  
 Powers, Victor S. (Uni. of Wash., '18).  
 Prichard, R. P. (Yale For. School, '09).  
 Prince, Edmund H., 2nd Lt. National Army.  
 Pryse, E. Morgan, forest assistant, U. S. F. S.

**Q**UINLAN, James, woodsman, Ten Saw Mill Units (Mass. Forestry Dept.)

**R**AINSFORD, W. K. (Yale For. School, '06).  
 Ramsdell, Willett F., deputy forest supervisor, U. S. F. S.  
 Rase, Frederick W., surveyor, U. S. F. S.  
 Rand, E. A., 1st Sgt., 20th Eng. (Forest), (Uni. of Me., '14).  
 Riblett, Carl H., forest ranger, U. S. F. S.  
 Rice, A. M., 20th Engineers (Forest).  
 Richards, E. C. M. (Yale For. School, '11).  
 Ricketts, Howard B., clerk, U. S. F. S.  
 Ridings, Troy G., 10th Engineers (Forest), American Exped. Forces, France, U. S. F. S.  
 Ringland, Arthur C., Capt. 10th Eng. (Forest), (Yale For. School, '05), forest inspector, U. S. F. S.  
 Rixson, C. L., forest clerk, U. S. F. S.  
 Roberts, Wesley K. (Uni. of Wash., '18)).  
 Robertson, Colin C. (Yale For. School, '07).  
 Robinson, S. E. (Yale For. School, '12)).  
 Robison, L. E., (Yale), 10th Engineers.  
 Rockey, K. E. (Yale For. School, '12).  
 Roeser, Jacob, Jr., forest assistant, U. S. F. S.  
 Root, Lloyd (Mt. Alto For. Acad., '17), Co. C., 10th Eng. (Forest), France, Pa. Dept. For.  
 Ross, R. M. (Bilt., '09), Forest Regiment.  
 Rowland, Arthur L. (Mt. Alto), Pa. Dept. For.  
 Rowland, Horace B., Jr. (Mt. Alto For. Acad., '15), Co. F., 10th Eng. (Forest), France, Pa. Dept. For.  
 Rush, William M., forest ranger, U. S. F. S.  
 Russell, Austin P., forest ranger, U. S. F. S.  
 Russell, Joseph P. (Uni. of Wash.).  
 Russell, William J., 20th Engineers, forest ranger, U. S. F. S.  
 Ryerson, K. A., 10th Engineers (Forest).

**S**ADLER, George M., forest ranger, U. S. F. S.  
 Salton, Robert C., forest ranger, U. S. F. S.  
 Sanford, E. C., 1st Lt., 10th Eng. (Forest), forest supervisor, U. S. F. S.  
 Sanger, Owen J., 1st Lt. Canadian Contingent (Uni. of Wash.).  
 Schmaelzle, Karl I. (Uni. of Wash.).  
 Schmitz, Henry (Uni. of Wash., '15).  
 Schoeller, J. Diehl (Uni. of Wash.), 1st Lt. Cavalry, Inf. School of Arms, Fort Sill, Oklahoma.

- Schowe, William A., forest ranger, U. S. F. S.  
 Scofield, William L. (Yale For. School, '13), for. rang., U. S. F. S.  
 Segur, Lewis L., forest ranger, U. S. F. S.  
 Seltzer, J. W., 1st Lt. (Pa. State For. Acad., '09), 10th Eng. (Forest), France, forester N. J. Zinc Co.  
 Senft, Walter M. (Mt. Alto), Pa. Dept. For.  
 Severance, H. M., New York National Guard.  
 Shaefer, Oscar F., 10th Engineers (Forest) American Exped. Forces, France.  
 Sharron, John L., Ten Saw Mill Units, Mass. Forestry Dept.  
 Sheeler, George W. (Mt. Alto, '12), Co. C., 502d Service Bat., Pa. Dept. For.  
 Shepard, H. B., 2nd Lt., 10th Eng. (Forest), forester Lincoln Pulp Co.  
 Shepard, Robert, 20th Engineers (Forest), American Univ., Wash., D. C., U. S. F. S.  
 Shenefelt, Ira Lee (Mt. Alto, '16), Co. C., 502d Service Bat., Pa. Dept. For.  
 Siggins, Howard W. (Mt. Alto For. Acad., '14), Co. C., 10th Eng. (Forest), Pa. Dept. For.  
 Silcox, F. A. (Yale For. School, '05), district forester, U. S. F. S.  
 Simons, S. T., 25th Eng., Camp Devens, Ayer, Mass., U. S. F. S.  
 Skeels, Dorr, Capt., 10th Eng. (Forest), Uni. of Montana.  
 Slonaker, L. V., 10th Engineers (Forest), American Exped. Forces, France, U. S. F. S.  
 Smith, A. Oakley (Yale For. School, '14).  
 Smith, Edwin F., forest ranger, U. S. F. S.  
 Smith, E. H., 1st Lt. 316th Inf., Pa. State Forestry Dept.  
 Smith, Edward S. (Mt. Alto, '16), Nat. Army, Camp Meade; Pa. Dept. For.  
 Smith, H. A. (Mt. Alto, '16), Field Hospital Ser., Fort Benj. Harrison, Indianapolis, Ind.; Pa. Dept. For.  
 Stadden, Robert W. (Mt. Alto, '14), 20th Eng. (Forest), Pa. Dept. For.  
 Speers, Vincent E., forest clerk, U. S. F. S.  
 Speidel, H. A. (Yale For. School, '11).  
 Staebner, R. C.; eng., Little River Lumber Co., Townsend, Tenn.  
 Stanton, L. G. (Uni. of Wash., '18).  
 Steer, Henry B. (Cornell, '15), 10th Eng. (Forest), U. S. Indian Service.  
 Stevens, Carl M. (Yale For. School, '12).  
 Stewart, Clifford H., forest ranger, U. S. F. S.  
 Stewart, Jefferson M., clerk, U. S. F. S.  
 Stone, Everett B. (Yale For. School, '17).  
 Stuart, R. Y., Capt., forest inspector, U. S. F. S.  
 Stults, Hal L., forest ranger, U. S. F. S.  
 Stutz, Jerome H. (Biltmore), 10th Engineers (Forest).  
 Swapp, Roy, forest ranger, U. S. F. S.  
 Sweeney, Joseph A., forest ranger, U. S. F. S.  
 Sweeney, Michael J., forest examiner, U. S. F. S.
- T**ARDY, Albert (Biltmore), New England Saw Mill Units.  
 Taylor, G. M., 2nd Lieut. (Cornell, '17).  
 Taylor, L. W. (Uni. of Calif.), 20th Engineers (Forest).  
 Thomas, F. H., 10th Engineers (Forest), American Exped. Forces, France, U. S. F. S.  
 Thomas, Harry L., Co. C., 10th Eng. (Forest), for. rang., Pa. Dept. For.  
 Thomas, John, 10th Eng. (Forest), France, for. rang., Pa. Dept. For.  
 Thompson, D. C. 2nd Lieut. (Cornell, '17).  
 Thompson, Jackson (Uni. of Wash., '16).  
 Thompson, Raymond H., forest ranger, U. S. F. S.  
 Tilson, Howard, 2nd Lieut. (Cornell, '17).
- Tommason, Thos., 10th Engineers (Forest), American Exped. Forces, France, U. S. F. S.  
 Turner, F., 2nd Lt. (Univ. of Calif.).  
 Tweedy, Temple (Yale For. School, '14).
- V**AN WICKLE, J. M. (Uni. of Wash.).  
 Van Arsdall, Howard (Mt. Alto), Pa. Dept. For.  
 Voight, Alfred W., forest ranger, U. S. F. S.  
 VanHorn, Harry E. (Mt. Alto For. Acad., '14), Co. A., 10th Eng. (Forest), France, Pa. Dept. For.  
 Van Riper, C. A., 20th Engineers (Forest).  
 Verge, Fred, woodsman, Ten Saw Mill Units (Mass For. Dept.).
- W**AGNER, G. C., Jr. (Yale For. School, '18)  
 Walsh, Harry A., Capt. Quartermaster's Dept., U. S. F. S.  
 Ward, Herbert S., clerk, U. S. F. S.  
 Walter, Roy Irving (Biltmore), Camp Jackson, S. C.  
 Warren, Avra M., 2nd Lt. National Army, 1st Battalion, 310th Infantry, Camp Dix, N. J.  
 Warren, M. C. (Uni. of Cal.), 10th Engineers (Forest).  
 Waters, Louis H., 20th Engineers (Forest), American Univ., Wash., D. C., U. S. F. S.  
 Webb, Walter R., Asst. Engineer in Forest Products, Radio Serv.  
 Weitknecht, Robert H., forest assistant, U. S. F. S.  
 Welby, Harry H. (Biltmore), 10th Engineers (Forest).  
 Wells, Arthur B. (Mt. Alto, '11), 18th Machine Gun Co., Fort Ethan Allen, Vt., Pa. Dept. For.  
 Wentling, Floyd, 10th Engineers (Forest), state forest warden.  
 Westfield, W. O. (Yale For. School, '16).  
 White, Martin E., forest ranger, U. S. F. S.  
 White, William E., forest examiner, U. S. F. S.  
 Wieslander, A. E., 20th Engineers (Forest).  
 Wilcox, J. M., Corporal Inf. (Uni. of Wash., '20).  
 Wilder, Raymond T., Private 20th Engineers (Forest), Mass. For. Dept.  
 Williams, Hubert C., 1st Lt. 10th Eng. (Forest), (Yale, '08).  
 Wilson, Stanley F. (Yale For. School, '14), for. rang., U. S. F. S.  
 Wirt, William (Uni. of Wash., '18).  
 Wise, Lloyd (Ohio State, '17).  
 Wisner, — — — Corp. 20th Eng. (Forest), (Syracuse, '17).  
 Withington, George T. (Biltmore), New England Saw Mill Units.  
 Wohlenburg, E. F., 2nd Lt., 10th Eng. (Forest), forest examiner, U. S. F. S.  
 Wold, Henry, Ordnance School, Eugene, Oregon, U. S. F. S.  
 Wolfe, Kenneth, forest ranger, U. S. F. S.  
 Wolfe, Stanley L., 1st Lt., U. S. F. S.  
 Woolsey, Theodore S., Jr. (Yale, '02); major 10th Eng. (Forest). Amer. Expeditionary Forces, France.  
 Woodruff, James A., Lt. Col. 10th Eng. (Forest).  
 Woods, J. B., 1st Lt. 10th Eng. (Forest).  
 Work, Herman, 1st Lt. 10th Eng. (Forest), deputy forest supervisor, U. S. F. S.  
 Wulff, Johannes (Yale For. School, '17).  
 Wycoff, Garnett (Ohio State, '13), 10th Engineers.
- Y**EOMANS, E. J. (Yale For. School, '12), for. rang., U. S. F. S.  
 Young, L. P., 2d Lt. Inf. (Uni. of Wash., '17).  
 Young, Douglas E., private English army, killed in France April 10, 1917 (state forest warden, Maryland).  
 Youngs, Lieut. Homer S., 16th U. S. Infantry, care of Adjutant General, War Dept., Washington, D. C., U. S. F. S.
- Z**ELLER, R. A., forest assistant, U. S. F. S.  
 Zieger, Robert H., forest ranger, U. S. F. S.  
 Ziegler, E. A., Capt. Coast Art., Direc. Pa. State For. Acad.

**A**PPROXIMATELY 1,500 fires occurred in the National Forests of California during the past season. They were suppressed at a cost of \$100,000. One hundred and fifty of these fires could be classified as severe. Between fifteen and eighteen thousand acres of timberlands were burned over.

**I**N order to speed up the getting of men, supplies and equipment to forest fires, Supervisor Erickson, of the Crater National Forest, uses an auto truck into which are loaded not only men and outfit, but also pack animals and equipment. After going as far as possible by auto the outfit is packed on the burros to the place it is needed.

### THE ANNUAL MEETING

**A**S a measure of wartime conservation it has been decided by the Board of Directors to dispense with the usual form of annual meeting of the American Forestry Association in January. Instead, a formal meeting without addresses or discussions will be held at the offices of the Association on Wednesday, January 9, at 10 A. M. in order to comply with the bylaws. When the war is over and the forestry regiments return from abroad a big meeting will be held to discuss war time forestry developments.

**O**NE of the most expensive woods used in America is boxwood. It sells for about \$1,500 per 1,000 board feet.



## RUGGED BEAR'S BREAST PEAK

BY GUY E. MITCHELL

**I**N our school geographies the Cascade Mountains receive but passing notice, as a small part of the Pacific Coast mountain system of the United States. As a matter of fact, the Cascade Range, extending from northern California northward through Oregon and Washington, form a tremendous and majestic forest-clad barrier of thousands of square miles, cutting off the Pacific Ocean

from the arid plains and valleys of the interior, and surmounted at frequent intervals by some of the most stupendous extinct volcanoes of the continent. The peaks and ridges rise high above the great Cascade plateau, which in ages past has been uplifted to an altitude above the sea of nearly 5,000 feet. The whole land is volcanic, the outflow from a multitude of vents, which in a remote period of the earth's history poured out countless thousands of billions of tons of lava and scoria. Out of these mountains, many of

them snow-clad through the greater part or even the entire year, come the rivers which, winding through the high valleys and augmented by many brooks and larger tributaries, constitute the great, strong running streams which feed the fertile irrigated lands to the east, or tumble down the more precipitate slopes to the west and produce a water power sufficient to turn the wheels of

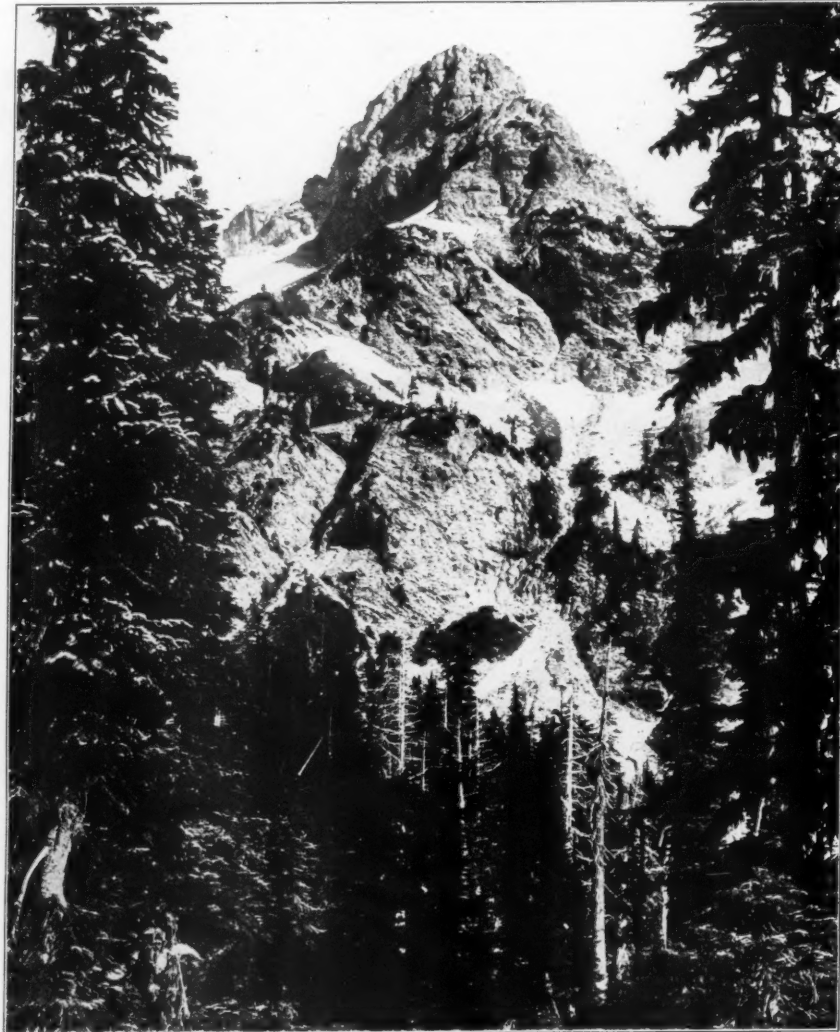
a thousand industries—one of the great and only slightly developed resources of America.

The photograph shows a typical mass of volcanic origin, one of the giant mountain peaks of the Cascade range, unheard of by more than one in ten thousand people outside of its immediate vicinity, a type of hundreds of other similar high peaks, but one of exceptional

beauty and ruggedness. It is not, however, as might be supposed, an extinct volcano; it is a mountain left by erosion, not built up by eruptions. This peak, known as Bear's Breast Peak, is at the head of the middle fork of the Snoqualmie River. Its altitude is 9,200 feet above sea level and its highest 2,000 feet rises above timber line, bare and rugged.

A severe test of mountaineering is the climbing of Bear's Breast Peak. What appear in the photograph to be but rough places are in fact impassable cliffs and rents in the rock, up or across which

no man can pass; yet once attained the view from the summit of the peak is incomparably fine, the grand chaos of the great Cascade range and plateau stretching away as far as the eye can see—100 miles or more in the intensely clear western atmosphere. The lower slopes of the mountains are richly clothed with heavy forests of majestic firs from 150 to 250 feet in height.



BEAR'S BREAST PEAK IN THE CASCADE MOUNTAINS

This is one of the most beautiful of the mountains of the Pacific Coast range, the view from the summit of which well repays the strenuous effort of him who climbs to the top.

## CANADIAN DEPARTMENT

ELLWOOD WILSON, SECRETARY,  
CANADIAN SOCIETY OF  
FOREST ENGINEERS

It is axiomatic that a man has a right to do what he likes with his own property. This right has been curtailed to the extent that the use a man makes of his property shall not injure the public or his neighbor. A man owning a tree may cut it down, but he must see that it does not fall on his neighbor's fence or house or otherwise damage his property. Further than this the Government has decreed that it has the right to protect a watershed of a navigable stream or of the water supply of a city by preventing the cutting of timber which would injure it. The State of New York has taken the position that a man may not cut his timber and leave his slash in such condition as to be a menace to other timber lands. Will not the time soon come, when realizing the long time element in the growing of timber and the fact that it takes more than one generation to grow a merchantable tree, the State will hold that no timber owner shall have the right to cut his timber without making adequate provision for its replacement, in time, except in the case of agricultural land where total clearing is a necessity. The case in the example of government-owned lands on which cutting rights are leased or sold is fairly clear, but is it a very great extension of the principle to ask that every man who comes into possession of timber land and wishes to use it as such, should be compelled to plant a tree for everyone he cuts. There is only one objection to such a policy from the selfish standpoint of the owner, and that is the cost. But here, just as in the case of private property taken for public ends, the general community should be willing to pay the ultimate cost by paying the enhanced price of the timber caused by the expense of replacing it for the future. As Professor Toumey has so well said, the question of replanting, in the very essence of things, is a matter for the public, and it should bear some part of the cost. Let the timber owner take the responsibility of replanting and let the community foot the bill, in increased timber prices.

The value of preparedness has been splendidly demonstrated in Canada. For the past few years the Commission of Conservation has been making an inventory of the kinds and location of timber in British Columbia. This past month the Government wanted to know where to get spruce for airplanes. Applying to the Commission, they were told at once, not only where to get it, but there was a man ready to show them. Mr. Craig, who has been in charge of this work, was immediately attached to the Imperial Munitions Board and will look after this work. The Commission is pressing for an inventory of tim-

ber in Ontario and Quebec and it is hoped that the work will commence next summer.

The preliminary report of the Commission on the condition of cut-over pulpwood lands, and the prospects of a future crop, has been made by Dr. Howe, of the University of Toronto. It is very interesting and significant. The lands in question are, like practically all forests from which pulpwood is cut, covered with mixed stands of spruce, balsam and hardwood. At first only the spruce was cut, then the loggers went back and took off smaller spruce and an increasing amount of balsam, and on the last cut nearly 78 per cent of balsam was taken to 22 per cent of spruce. Such cutting, of course, favors the growth of hardwoods and leaves them predominant in the stand, overshadowing and suppressing the young spruce and balsam left. It is shown that, under these conditions existing on the lands, it takes 40 years for the little spruce trees to grow one inch in diameter, 100 years to make a six-inch tree and 150 years to reach the minimum diameter of 12 inches established by the cutting regulations in Quebec. Balsam grows somewhat faster. One inch in diameter is reached in about 16 years and seven inches at about 70 years. These statements refer to the time required to make a merchantable forest from the seedling stage onward. There are on the average 30 spruce and 59 balsam trees per acre from four to eight inches in diameter already present. These will furnish another crop in time, but the time is long. The growth tables show that it will require about 70 years for the four-inch trees and about 50 years for the eight-inch trees to reach the 12-inch diameter limit. The larger balsam, however, will be merchantable in 10 years. There are only six spruce and six balsam trees over eight inches diameter on the average acre. This number is too small to justify exploitation alone, so that the next cutting must be delayed until a sufficient number of the smaller trees reach a merchantable size. On these heavily culled lands it will probably be found that henceforward a period of from 30 to 60 years must elapse between cuttings, if only spruce and balsam are to be removed. Unless the hardwoods are to be removed and thus give the soft woods a chance, it will prove cheaper and more expeditious to plant trees, rather than to wait for the next cut furnished by nature.

The report of the St. Maurice Forest Protective Association for 1917 is in and shows that a total of 4,367 acres were burned over this summer, only 287 acres of which were in merchantable timber. Cut-over areas and old burns showed 2,272 and 1,592 acres respectively, again demonstrating the fact that cut-over land is the worst hazard and the land which most needs protection. This cannot be efficiently given until some system of slash disposal is put in force. The cost of extinguishing fires by extra labor has dropped from \$13,001 in 1914 to \$1,050 this year, showing very forcibly that most of our fires were extin-

guished in their incipency by the rangers. The causes of fires were as follows:

Railways .....	122
Section Men.....	4
Unknown .....	38
Construction Work.....	26
Drivers .....	5
Dam Builders.....	8
Fishermen .....	8
Settlers .....	4
Jobbers .....	2
Total.....	217

The forest survey of New Brunswick is making good progress under Director G. H. Prince. Nine hundred and twenty-five thousand acres have been mapped this year, making a total of 1,200,000 acres since the start of the survey, or about 16 per cent. of the total area of Crown land in the province. The Forestry Department will co-operate in the scaling and logging inspection this winter.

H. R. MacMillan has gone with Canadian Aeroplanes, Ltd., a branch of the Imperial Munitions Board, to take charge of procuring spruce for airplanes.

The secretary of the Canadian Forestry Association is making a lecture tour through the Province of New Brunswick. He is having large audiences and much interest is shown in his work.

In Alberta the Dominion Forest Service has built about 20 miles of telephone line and carried on its program of trail building. Four of the Alberta men are reported as having joined the "Boys at the Front" lately. In the Crowsnest Pass a fire occurred during the past summer which cost \$4,500 to extinguish. R. H. Roberts, assistant to Inspector Gutches, is going overseas with the 20th U. S. Engineers (Forest). Prof. W. N. Millar, late of the University of Toronto, is with the 10th U. S. Engineers (Forest), which is officered and largely manned by United States Forest Service men.

A bulletin has been published in Australia giving the details of the investigations of Mr. D. W. Paterson into the paper pulp situation, and his recommendations. He recommended that spruce and poplar should be planted in the high altitudes of Victoria in proximity to water powers available for pulp mills. He said that spruce could be first cut for pulp after 15 years and that 900 acres would supply the needs of Australia for one year. His advice was that 2,000 acres be planted the first year and 1,000 acres yearly after that until the first planted trees were ready for cutting. After an area is cut it is to be replanted and thus a continuous supply of timber insured, as it is not economical to cut pulpwood from mixed forests and that only pure stands will pay. Mr. Paterson's estimate is that the profit realized after 15 years, including interest on capital and all costs, other than payment for the land, provided cheap water power was available, would be \$120 per acre.

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## BOOK REVIEWS

Stories which will appeal to children of all races and climes appear in a book just issued by the American Book Company, New York, Cincinnati and Chicago. Under the title "Stories the Iroquois Tell Their Children," Miss Mabel Powers has collected and given the world thirty or more tales of genuine charm. They are divided into two classifications, Iroquois wonder stories and Iroquois fairy stories. Miss Powers has been adopted by the Senecas and is known as Yeh sen noh wehs. The book has a foreword of approval signed by the chiefs of the six tribes.

Hundreds of commodities are listed in the new issue of "Du Pont Products," just issued by E. I. du Pont de Nemours & Company. The book shows that this manufacturing concern and its subsidiary companies have undergone an enormous expansion since the beginning of the war. Particularly interesting is the expansion in the line of chemicals, made necessary by the inability of this country to import many of the chemicals essential to various branches of industry. Many of the commodities listed have not before been made in America. The book may be had by applying to the offices of the company at Wilmington, Delaware.

Foods and Household Management; a Textbook of the Household Arts, by Helen Kinne, professor, and Anna M. Cooley, associate professor, of Household Arts Education, Teachers' College, Columbia University. The Mac-Millan Company, New York. Price \$1.10.

For use in high schools and normal schools this book offers a valuable adjunct to the course in household arts. In its preparation due regard was had for its use in the home as well. The contents include a treatment of the cost and purchasing of foodstuffs, the management of the home and other questions vital to the economy and health of the household. Specific treatment is accorded foods, their production, sanitation, cost, nutritive value, preparation and serving. The work includes approximately 160 carefully selected recipes and a large number of cooking exercises of more experimental nature, designed to develop initiative and resourcefulness. The book is practical and economical.

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The Forests of Maryland, by State Forester F. W. Besley. The Maryland State Board of Forestry, Baltimore.

Information useful to the forest owner, the timber buyer, the manufacturer and the student is embraced in the book just issued by State Forester F. W. Besley for the Maryland State Board of Forestry. The report is based on an accurate and complete inventory of the forest resources of the state and contains separate forest maps for each county. The purpose of the book is to show in condensed form and orderly manner the state's forest wealth, its value to the people, and how the resources may be best conserved by wise use for supplying present needs and the needs of the future. Of the total land area of 6,330,000 acres Maryland has a woodland acreage of 2,228,000, or 35 per cent. The book is interesting and of practical value.

### Relation of Birds to Forests.

The Indiana State Board of Forestry, in order to encourage the protection of birds and study their relation to forest life, is offering prizes to the pupils of schools for the best essay on the "Relation of Birds to Indiana Forests." For the best essay from the seventh and eighth grades, respectively, a prize of \$5 will be given. For the best essay from each of the high school classes a prize of \$7.50 will be given. The offer is extended to all schools doing work equivalent to the grade and high schools.

The essay must not exceed 2,000 words, and must be mailed to the Secretary, State Board of Forestry, not later than May 15, 1918. It is suggested that pupils who expect to enter the contest write for the rules governing the contest.

Birds of America (Nature Lover's Library).

The University Society, Inc., New York.  
3 volumes, price \$29.50 a set.

As a contribution to the literature of America this is a notable work. The aim of its compilers was to present a complete review of the available knowledge concerning birds. The fundamental factor in the undertaking was a realization that the task of preparing a comprehensive account of the bird life of the continent is too great to be accomplished in a lifetime by any individual working alone. Co-operation on the part of many authorities was deemed essential and the array of talent represented in the list of compilers is an indication of the scale of the enterprise. The editor-in-chief was T. Gilbert Pearson, of the National Association of Audubon Societies. John Burroughs was consulting editor; George Gladden managing editor and J. Ellis Burdick associate editor. The special contributors were Edward H. Forbush, state ornithologist of Massachusetts; Herbert K. Job, ornithologist for the Audubon Societies; William L. Finley, state biologist for Oregon, and L. Nelson Nichols, member of the Linnaean Society.

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## CURRENT LITERATURE MONTHLY LIST FOR NOVEMBER, 1917

(Books and periodicals indexed in the library of the United States Forest Service.)

### FORESTRY AS A WHOLE

Proceedings and reports of associations, forest officers, etc.  
Philippine Islands—Bureau of forestry. Annual report of the director of forestry for the fiscal year ended Dec. 31, 1916. 83 p. Manila, 1917.

### FOREST AESTHETICS

Street and park trees  
Newark, N. J.—Shade tree commission. Four centuries of trees in Newark; arbor day, 1917. 7 p. il. Newark, 1917.  
Newark, N. J.—Shade tree commission. Thirteenth annual report, 1916. 66 p. il. Newark, 1917.

Trelease, William—Plant materials of decorative gardening; the woody plants. 294 p. Urbana, Ill., pub. by the author, 1917.

### FOREST EDUCATION

Arbor day  
Alabama—Dept. of education. Good roads; arbor day, Feb. 23, 1917. 16 p. il. Montgomery, Ala., 1917. (Bulletin No. 47.)

### Forest schools

Michigan, university of—College of literature, science and the arts. Announcement of the curriculum in forestry, 1917-1918. 38 p. Ann Arbor, 1917.

Minnesota, University of—College of forestry. Announcement for the year 1917-1918. 37 p. Minneapolis, 1917.

### FOREST BOTANY

Maiden, J. H.—The forest flora of New South Wales, pt. 61. 37 p. pl. Sydney. N. S. W., Gov't. Printer, 1917.

### SILVICULTURAL STUDIES OF SPECIES

Kirwan, J. D. Maitland. Note on babul, *Acacia arabica*. 14 p. pl. Calcutta, 1917. (India—Forest dept. Forest bulletin No. 35.)

Murphy, Louis S. The red spruce; its growth and management. 100 p. pl. Wash., D. C., 1917. (U. S.—Dept. of agriculture. Bulletin 544.)

### FOREST PROTECTION

#### Insects

Gill, John B. Important pecan insects and their control. 48 p. il. Wash., D. C., 1917. (U. S.—Dept. of agriculture. Farmers' bulletin 843.)

### FOREST LEGISLATION

France—Laws, statutes, etc. Decret du 3 Juillet 1917, relatif a la creation d'un comite charge de l'examen des questions concernant les exploitations commerciales et industries des bois. 5 p. Paris, 1917.

Kinney, Jay P. The development of forest law in America. 254 p. N. Y., J. Wiley & Sons, 1917.

### FOREST ADMINISTRATION

Andrews, C. C. What thirty-nine states are doing in forestry. 11 p. St. Paul, Minn., State forestry board, 1917.

United States—Dept. of agriculture—Forest service. October field program. 1917. 29 p. Wash., D. C., 1917.

### National and state forests

Wild gardens of Acadia. Sieur de Monts national monument; the White moun-

tain national forest. 64 p. il. Bar Harbor, Maine, 1917.

#### FOREST UTILIZATION

**Lumber industry**  
British Columbia—Dept. of lands—Forest branch. Directory of lumber dealers stocking British Columbia woods and lumber wholesalers handling British Columbia woods in eastern Canada. 12 p. il. Victoria, B. C., 1917. (Bulletin No. 20.)

Sociedade nacional de agricultura, Rio de Janeiro. O corte das mattas e a exportacao das madeiras brasileiras 33 p. Rio de Janeiro, 1917.

United States—Interstate commerce commission. No. 8131, in the matter of rates on and classification of lumber and lumber products; report proposed by Examiner Fred H. Esch. 71 p. Wash., D. C., 1917.

**Wood-using industries**  
Bryan, A. Hugh. Maple sugar; composition, methods of analysis, effect of environment. 46 p. Wash., D. C., 1917. (U. S.—Dept. of agriculture. Bulletin 466.)

**Forest by-products**  
Hawes, Austin F. Emergency fuel from the farm woodland. 8 p. Wash., D. C., 1917. (U. S.—Dept. of agriculture—Office of the secretary. Circular 79.)  
Lockwood trade journal co., inc. Lockwood's directory of the paper, stationery and allied trade. 43d edition, 1918. 786 p. N. Y., 1917.

Southern pine association. Floors of service. 30 p. il. New Orleans, La., 1917.

#### WOOD TECHNOLOGY

Jolly, N. W. Notes on the principal timbers of Queensland. 20 p. Brisbane, 1917. (Queensland—Dept. of public lands. Forestry bulletin No. 2.)

Jolly, N. W. The structure and identification of Queensland woods. 14 p. pl. Brisbane, 1917. (Queensland—Dept. of public lands. Forestry bulletin No. 1.)

New South Wales—Dept. of lands—Forestry branch. Forestry handbook, pt. 2: Some of the principal commercial trees of New South Wales, by J. H. Maiden. 224 p. pl. Sydney, Gov't. printer, 1917.

United States—Dept. of agriculture—Forest service. Guidebook for the identification of woods used for ties and timbers, by Arthur Koehler. 79 p. il., pl. Wash., D. C., 1917.

#### AUXILIARY SUBJECTS

**Plant ecology**  
Adams, J. The quantitative study of climatic factors in relation to plant life. 19 p. Ottawa, Royal Society of Canada, 1916.

**Grazing**  
Aldous, A. E. Eradicating tall larkspur on cattle ranges in the national forests. 23 p. il. Wash., D. C., 1917. (U. S.—Dept. of agriculture. Farmers' bulletin 826.)

**Aviation**  
Duchene, Emile Auguste. The mechanics of the airplane; a study of the principles of flight. 230 p. il. London, Longmans, Green & Co., 1916.

Eiffel, Gustave. Nouvelles recherches sur

la resistance de l'air et l'aviation faites au laboratoire d'Auteuil; texte et atlas. il., pl. Paris. H. Dunod et E. Pinat, 1914.

Fage, A. The airplane; a concise scientific study. 3d ed. 176 p. il. London, Chas. Griffin & Co., 1917.

Loening, Grover Cleveland. Military airplanes. 5th ed. 182 p. il. N. Y., D. Van Nostrand Co., 1917.

#### PERIODICAL ARTICLES

Miscellaneous periodicals

Aerial age, Nov. 5, 1917—Technical considerations of materials employed in airplane construction, by O. Pomolio, p. 331.

American city, Aug. 1917—Afforestation of municipal watershed, Baltimore, by R. B. Maxwell, p. 157-8.

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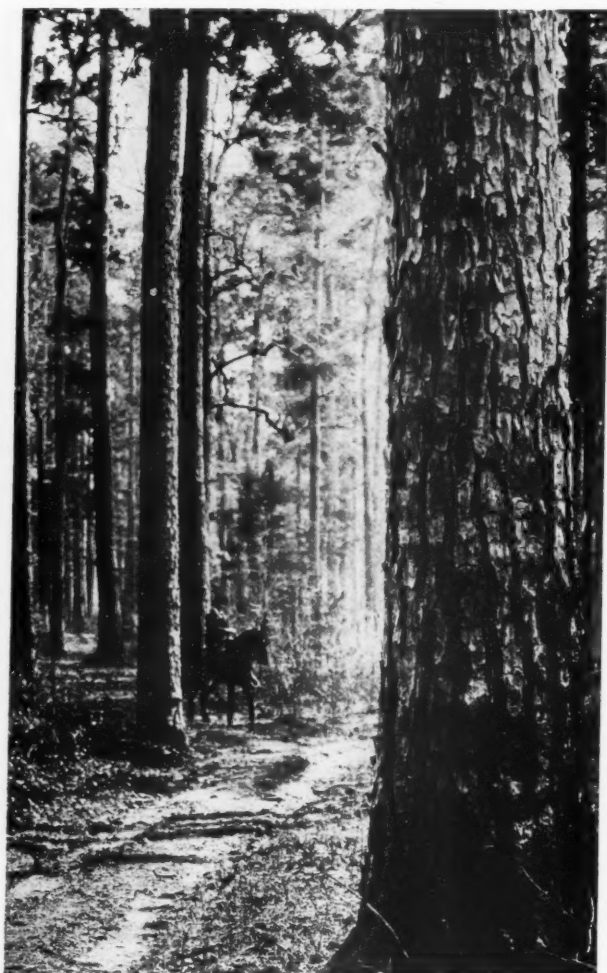
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Aviation, Nov. 1, 1917—Kiln-dried airplane woods, by U. S. Dept. of agriculture. Forest Service, p. 461.





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Bulletin agricole du Congo Belge, March-June, 1917—Note sur le cubage d'une parcelle d'essai dans le foret vierge de Yangambi, Congo central, by E. Lep-lae, p. 89-98.

Conservation, Nov. 1917—Our airplane spruce may win the war, by Clyde Leavitt, p. 41.

Country gentleman, Oct. 27, 1917—What to do with blighted chestnut, by Gene Day, p. 31.

Forest and stream, Nov. 1917—The building of the open log camp, by William S. Wicks, p. 540, 562.

House beautiful, Sept. 1917—Native woods for building, by C. M. Price, p. 189-92; Inside wood finish, by Thomas P. Robinson, p. 214-15.

In the open, Oct. 1917—Pennsylvania and her forests, by N. R. McNaughton, p. 32-40.

Journal of heredity, Nov. 1917—Choosing the best tree seeds; the influence of parental character and environment upon the progeny of Douglas fir, by Charles J. Kraebel, p. 483-92.

Nature-study review, Oct. 1917—Necessity for greater accuracy in describing American trees, by R. W. Shufeldt, p. 288-94.

New country life, Nov. 1917—The trees of Flushing, by Charles H. Murch, p. 88, 90.

New Zealand journal of agriculture, Sept. 1917—Economical afforestation in Nelson, by H. G. Kingsland, p. 145-50.

Phytopathology, Oct. 1917—Arthropods and gasteropods as carriers of Cronartium ribicola in greenhouses, by G. Flippo Gravatt and Rush P. Marshall, p. 368-73.

Plant world, Sept. 1917—The indicator significance of native vegetation in the determination of forest sites, by Clarence F. Korstian, p. 267-87.

Pleasureland, Nov. 1917—Grand Canon of the Colorado, by Enos A. Mills, p. 3-4 19; Birds and wild life of Colorado, by Wallace I. Hutchinson, p. 7, 18.

Scientific American, Sept. 8, 1917—Chemical products from the forests, by A. V. Schorger, p. 173, 181.

Scientific American, Sept. 15, 1917—Lengthening the life of wood; cooking logs in creosote to prevent the inroads of decay, by Ernest Elva Weir, p. 189, 198.

Scientific American, Sept. 22, 1917—Fighting with axe and saw; a regiment of American lumberjacks and foresters for European service, by C. H. Claudy, p. 204, 215; Why trees lose their leaves, by S. Leonard Bastin, p. 211.

Scientific American supplement, June 16, 1917—The revival of wooden shipbuilding, p. 369, 376-7.

Scientific American supplement, July 28, 1917—True greenheart is not poisonous, by C. D. Mell, p. 55.

Scientific American supplement, Aug. 11, 1917—The effect of the weather on forest fires, by Andrew H. Palmer, p. 81, 88-9.

# NATIONAL FOREST TIMBER FOR SALE

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**DISTRICT FORESTER**  
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- Scientific American supplement, Sept. 15, 1917—Proper methods of turpentine; increased yield obtained without serious injury to the tree. by Eloise Gerry, p. 168-9.
- Scientific monthly, Sept. 1917—The woodlot; a problem for New England farmers, by James W. Toumey, p. 193-203.
- United States—Dept. of agriculture. Journal of agricultural research, Nov. 5, 1917.—Diagnosing white pine blister-rust from its mycelium, by Reginald H. Colley, p. 281-6.
- Trade Journals and Consular Reports  
American lumberman, Oct. 13, 1917—Eastern factory builders favor Calcasieu pine, p. 34-6.
- American lumberman, Oct. 27, 1917—Pacific logging congress in 9th annual, p. 43-50.
- American lumberman, Nov. 3, 1917—How to pile lumber for the best results, p. 51-2.
- American lumberman, Nov. 10, 1917—The present lumber situation in Great Britain, by W. J. Drewry, p. 40.
- Canada lumberman, Oct. 15, 1917—Chain drag saw and log measuring device, by W. D. Starbird, p. 29-30.
- Canada lumberman, Nov. 1, 1917—Logging railroad construction, by James O'Hearn, p. 31-2.
- Disston crucible, Oct. 1917—Pioneer lumbering and its development, by W. E. Dudley, p. 132-3, 142.
- Electrical world, Sept. 29, 1917—Prolonging the existence of cedar poles, by Herbert W. Meyer, p. 610-11.
- Engineering news-record, Nov. 1, 1917—Field tests made on oil treatment of wood against marine borers, by C. H. Teesdale and L. F. Shackell, p. 833-7.
- Engineering news-record, Nov. 8, 1917—Tests on nailed joints in fir and hemlock timbers, p. 871-2.
- Hardwood record, Oct. 25, 1917—Lumber and other forest products, p. 35.
- Hardwood record, Nov. 10, 1917—Hickory at home and abroad, by J. Crow Taylor, p. 39.
- Lumber trade journal, Nov. 1, 1917—Southern logging association; seventh annual meeting, p. 19-36; Relative costs of logging large and small timber as shown by experiments by W. W. Ashe, p. 36-7.
- Manufacturers' record, Sept. 20, 1917—Denuding North Carolina's mountain of logging large and small timber as ranges, by Fred A. Olds, p. 71.
- Mississippi Valley lumbermen, Oct. 19, 1917—The manufacture of cedar chests, by O. R. M., p. 42.
- Paper, Oct. 31, 1917—Details of the sulphite process, by C. C. Heritage, p. 15-19.
- Paper maker, Oct. 1, 1917—Paper fibre rugs, p. 315.
- Paper mill, Oct. 20, 1917—Uses of wood, by John S. Bates, p. 14, 38; Spanish forests and paper, p. 40.
- Paper mill, Nov. 3, 1917—Dyes from pulp waste, by J. R. Silver, p. 40.

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Pioneer western lumberman, Oct. 15, 1917—Utilization of Oregon yellow pine forests, p. 21-2.

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Pulp and paper magazine, Oct. 18, 1917—Paper clothes in Germany, p. 981.

Pulp and paper magazine, Oct. 25, 1917—Pulp wood resources of northern Manitoba, by J. A. Campbell, p. 1007-8.

Pulp and paper magazine, Nov. 1, 1917—The determination of sulphur in paper, by E. Sutermeister, p. 1021-2.

St. Louis lumberman, Oct. 15, 1917—The two forest regiments, 10th and 20th engineers, p. 51-2.

St. Louis lumberman, Nov. 1, 1917—Oak flooring, by Arthur Bruce, p. 50 D.

Southern lumberman, Nov. 3, 1917—Second forestry regiment getting ready for foreign service, p. 24-5; Indian summer and forest fires, by R. S. Maddox, p. 26 D; forest service exhibit features Texas fair, p. 35.

Timber trades journal, Oct. 6, 1917—The Weymouth pine as a timber tree, by A. D. Webster, p. 479.

Timber trades journal, Oct. 13, 1917—Airplane timbers, p. 514-15.

Timber trades journal, Oct. 20, 1917—Douglas fir and chalky soil, by Wm. Somerville, p. 579-80; Replanting of cleared woodlands, by W. Goldring, p. 583-4.

Timberman, Oct., 1917—Tests of holding power of nails in Douglas fir and western hemlock, p. 37-41; Seeking mechanical tree felling device, p. 48 C.

United States daily consular report, Oct. 20, 1917—Supply of boxwood in Japan, by Henry B. Hitchcock, p. 278.

United States daily consular report, Oct. 24, 1917—Woodworking machinery in foreign countries, by E. Haldeman Dennison and others, p. 327-34.

United States daily consular report, Nov. 1, 1917—National regulation of forests in Italy, by Quincy F. Roberts, p. 437; Manufacture of wintergreen oil in India, by Puran Singh, p. 440.

United States daily consular report, Nov. 6, 1917—South Africa's wattle-bark trade, p. 508-10.

West Coast lumberman, Oct. 1, 1917—Seattle lumber buyer tells best method of piling railroad material, by J. F. Rothschild, p. 26 A.

West Coast lumberman, Oct. 15, 1917—How best can the universities co-operate with the logging industry, by Hugo Winkenwerder and C. H. Shattuck, p. 25, 35.

Woodworker, Oct. 1917—Proper finish of the woodwork, by G. D. Crain, Jr., p. 29-30; Piling for drying in yard, kiln and factory, by John Hazen, p. 32-3.

**Forest Journals**  
American forestry, Nov., 1917—Relief fund for the forestry regiments, p. 643; Foresters in world's largest regiment, p. 644-652; American foresters in military service, p. 652-654; Forestry at Bates college, p. 655; Changes in the Georgia state forest school, p. 655; Tree's long journey on truck, p. 655; The pine, by Mabel Powers, p. 656; "Doctor Moun-



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Forest leaves, Oct. 1917—The upper Ohio river drainage basin, by George M. Lehman, p. 66-70; The camp and the camp fire, p. 71-2; Forest fire prevention; the old way and the new, by George H. Wirt, p. 72-4; Extinction of forest fires, by Leonard G. Barnes, p. 75-8; A word on the right use of our land, by Filibert Roth, p. 78-9.

Indian forest records, 1917—Statistics compiled in the office of the silviculturist, Forest research institute, Dehra Dun, during 1915-16, p. 31-96.

Indian forester, Aug. 1917—Teak regeneration under the uniform system in Mohnyin, by H. R. Blanford, p. 339-62; Note on the galls of *Piscacia integerima*, by Puran Singh, p. 366-7; A fossil wood from Burma, by Ruth Holden, p. 372-8; The conifer leaf oil industry, by A. W. Schorger, p. 379-86; What is kapok? p. 386-8.

Journal of forestry, Oct. 1917—The density of stand and rate of growth of Arizona yellow pine as influenced by climatic conditions, by Forrest Shreve, p. 695-707; Forest service stumpage appraisals, by James W. Girard, p. 708-25; Forest succession and rate of growth in sphagnum bogs, by George B. Rigg, p. 726-39; Recent forestry propaganda in the Philippines, by Wm. Forsythe Sherfesse, p. 740-56; Aspen as a permanent forest type, by James M. Fetherolf, p. 757-60; Notes on white pine four-year transplants, by S. N. Spring, p. 761-2; Dying of young pines in circles about anthills, by Ferdinand W. Haasis, p. 763-71.

Revue des eaux et forets, Sept. 1, 1917—Le robinier, by A. Jolyet, p. 257-61; Association de l'épicéa au sapin dans les sapinières des Hautes Vosges, by E. Mer, p. 262-70.

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**IT IS A VOLUNTARY** organization for the inculcation and spread of a forest policy on a scale adequate for our economic needs, and any person is eligible for membership.

**IT IS INDEPENDENT**, has no official connection with any Federal or State department or policy, and is devoted to a public service conducive to national prosperity.

**IT ASSERTS THAT** forestry means the propagation and care of forests for the production of timber as a crop; protection of watersheds; utilization of non-agricultural soil; use of forests for public recreation.

**IT DECLARES THAT FORESTRY** is of immense importance to the people; that the census of 1913 shows our forests annually supply over one and a quarter billion dollars' worth of products; employ 735,000 people; pay \$367,000,000 in wages; cover 550,000,000 acres unsuited for agriculture; regulate the distribution of water; prevent erosion of lands; and are essential to the beauty of the country and the health of the nation.

**IT RECOGNIZES THAT** forestry is an industry limited by economic conditions; that private owners should be aided and encouraged by investigations, demonstrations, and educational work, since they cannot be expected to practice forestry at a financial loss; that Federal and State governments should undertake scientific forestry upon National and State forest reserves for the benefit of the public.

**IT WILL DEVOTE** its influence and educational facilities to the development of public thought and knowledge along these practical lines.

### It Will Support These Policies

**National and State Forests under Federal and State Ownership**, administration and management respectively; adequate appropriations for their care and management; Federal co-operation with the States, especially in forest fire protection.

**State Activity** by acquirement of forest lands; organization for fire protection; encouragement of forest planting by communal and private owners, non-political departmentally independent forest organization, with liberal appropriations for these purposes.

**Forest Fire Protection** by Federal, State and fire protective agencies, and its encouragement and extension, individually and by co-operation; without adequate fire protection all other measures for forest crop production will fail.

**Forest Planting** by Federal and State governments and long-lived corporations and acquirement of waste lands for this purpose; and also planting by private owners, where profitable, and encouragement of natural regeneration.

**Forest Taxation Reforms** removing unjust burdens from owners of growing timber.

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**Classification** by experts of lands best suited for farming and those best suited for forestry; and liberal national and State appropriations for this work.

